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MICHEL EUGENE CHEVREUIL.

MICHEL EUGENE CHEVREUIL, the eminent French chemist, whose hundredth birthday has just been celebrated in Paris, was born on the 31st of August, 1786, in Angiers. *La Nature* gives a very interesting account of his remarkable life, from which we extract a few passages and reproduce our illustration. His father was Michel Chevreuil, Master of Surgery and Doctor of Medicine. Claude Bachelier, his grandfather, and Gilles Chevreuil, his great uncle, were both Masters of Surgery. His father lived to the age of ninety-one, and was a prolific writer and noted for great intelligence, and excellent health. His mother, a woman of great sense and virtue, lived to the age of ninety-three.

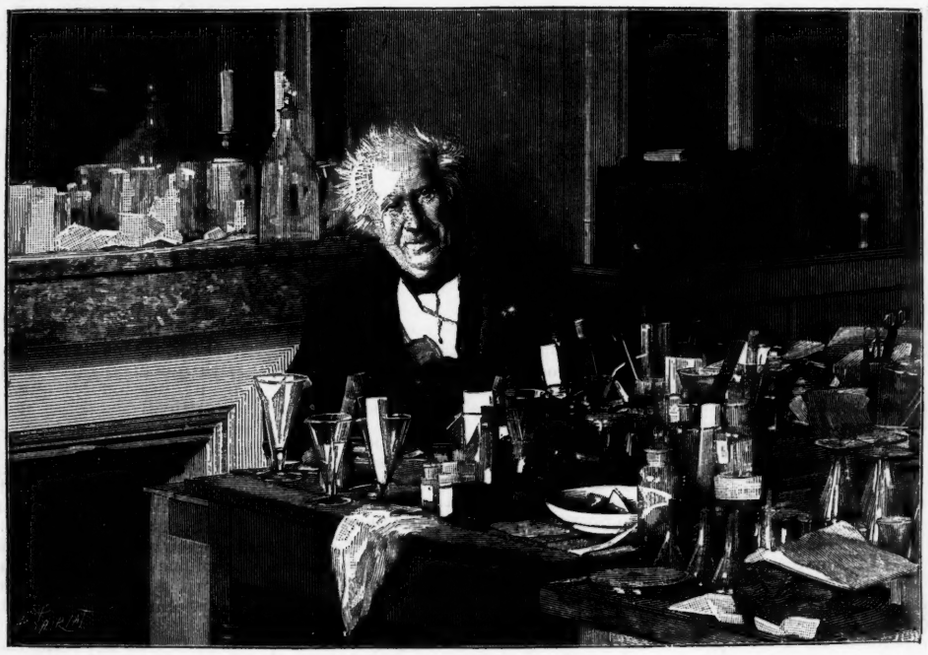
The youth of Chevreuil was passed in Angiers, and while there he witnessed in 1793 the beheading of two girls who had been accused of sheltering some heretical priests. At Murs, on the Loire, where his parents had a country-house, he witnessed the sanguinary battle of Murs Rock, between the Vendeans and Republicans. Nevertheless, in recent years, he has spoken of having passed the pleasantest days of his life at Murs, and expressed the desire to be buried there.

After the revolution, the old University of Angiers having been replaced by a "central school," young Chevreuil became a student between the years of twelve to seventeen. His first professor of chemistry was Héron, who was reputed, among his pupils, for his faculty of lucid teaching. Before Héron's death at an advanced age in Angiers, while academical inspector, Chevreuil had already achieved a brilliant reputation. Upon leaving college in 1797, Chevreuil was admitted to the laboratory of Vauquelin, in Paris. Fourcroy was laboring to secure the restoration of advanced studies, and was teaching at the Museum, having relinquished his chair of the College of France to his old assistant, Vauquelin, of whom Dumas said that he "was all chemist, chemist every day of his life, and chemist all day long."

Thenard was his laboratory superintendent and was followed by Orfila, Payen, Bouchardat, Frémy, and others of note. Chevreuil had hardly reached twenty years of age when Vauquelin gave him the direction of his laboratory, at which time he was also teaching in Charlemagne College. In four years more he became preparator at the Museum, and at the age of thirty was appointed director of the dye-works and special professor of chemistry at the Gobelin works.

It was Chevreuil who discovered the stearin candle. In 1814 he demonstrated the existence of olein, margarin, and stearin as component elements of oils and fats. His theory of saponification and labors in connection with fats (1823) not only created new industries, but widened the horizon for organic chemistry and opened the way for other discoveries. Turning his attention to the chemistry and science of colors, he reduced the alliance of colors to exact scientific laws, and in 1864 his book upon this subject reproduced the labor of many years, having been preceded in 1828, 1831, 1839, and 1848 by memoirs upon this subject. In the later work Chevreuil traced the rules of those undulatory and fugitive effects produced by the colors of walls, furniture, wood, fabrics, and clothing upon the flesh color of human beings and even went so far as to relate to the arrangement of flowers and ornamental plants in gardens. His enunciation of the laws governing the simultaneous or successive contrasts of colors, the theory of colored shadows, and the art of defining by means of a chromatic circle every shade by a figure, has enabled the reproduction in foreign countries, and without his seeing them, the tones of a fabric or tints of a picture painted in Europe.

In 1826 he was elected to the vacancy in the chemical section of the Academy of Sciences, caused by the death of Proust. None of his contemporaries of that epoch are now alive. In 1830 he became Director of the Museum, and so continued until he relinquished it to Frémy in 1883. For many years he was examiner at the Polytechnic School. He has also been President of the National Agricultural Society. All the leading scientific bodies of the world, such as the Royal Society of London, and the Scientific Societies of Copenhagen, Stockholm, Berlin, Moscow, Philadelphia, and others, have included him among their foreign members. Until 1855 he had been a member of the jury of every French exhibition. He became a member of the Legion of Honor, and in 1844 was a commander; a grand officer in 1865, and in 1875 he received the grand cross. The foreign decorations that he has received would cover his entire breast. His life has been passed between the Museum of Natural History, the Gobelins tapestry works, and the Institute of France, and he has never failed to be present at the Monday meeting of the Academy.



MICHEL EUGENE CHEVREUIL.
(One hundred years old.)

The number of memoirs of which he has been the author are almost incalculable. During the Franco-Prussian war (1870-71), he remained within Paris during the siege, living at the Museum even while more than eighty Prussian shells were shattering the galleries and breaking the cases. His library at the Museum is large and is still increasing. The secret of his life would seem to be *work* and *moderation*. His wife died many years ago and he has since lived alone, with only a couple of servants, his only son residing at Dijon.

Mr. Chevreuil has accumulated a large fortune by his scientific labors and it is still increasing. During a few years past, his life has been almost a constant ovation, but he still continues to work in his laboratory, and to take a prominent part in the work of the scientific bodies with which he is connected.

Mr. Chevreuil is tall and straight,

elegant in manner, and matchless in affability, and it is rarely the case that, in approaching a person, he has not a smile upon his countenance. He has a splendid head, with a wide and powerful forehead, and white hair. He is a man of humor as well as genius. Upon recently employing a new preparator, he remarked: "You must have courage in order to accept a situation as my curator. I have already killed four."

In his mode of life Mr. Chevreuil is very temperate, drinking nothing besides water and beer. His vigor is shown by the statement recently made by the daily papers that on the evening of his centenary he attended the opera.

NOTES ON THE PHARMACY OF HYDRONAPHTHOL.*

BY THOMAS D. McELHENIE.

HYDRONAPHTHOL was introduced about a year ago by Messrs. Rigney and Wolff, of New York. The principal literature on the subject is a series of articles by George R. Fowler, M.D., of Brooklyn, on its uses in surgery, the first of which appeared in the *New York Med. Journal*, for October 3d, 1885. About this time, at Dr. Fowler's request, I prepared two cases of sponges with the new antiseptic for use in St. Mary's Hospital, and have taken some interest in it since. Dr. Fowler reviews the chemistry of hydronaphthol, showing its relation to the phenol series, and then describes very exhaustive investigations into its antiseptic properties. A few notes on its chemical nature may not be out of place here. There are two hydroxyl substitution compounds of naphthalin known as *alpha-* and *beta*-naphthol, made by heating naphthalin with sulphuric acid; alpha-naphthol is formed between 60° and 90° C., and beta-naphthol between 180° and 190° C.

The alpha- or beta-naphthol monosulphonic acid thus formed is decomposed by sodium hydrate into sodium naphtholate, sodium sulphite, and sodium hydrate. The sodium naphtholate, when decomposed with hydrochloric or sulphuric acid, yields naphthol, which is then purified by sublimation. The term hydro-naphthol, although slightly vague in a scientific sense, indicates the origin and chemical kinship, and is a convenient term for commercial use. It is found to be about twelve times as strong as phenol in antiseptic power, and possesses several other advantages over that substance. It is non-irritant and non-corrosive and non-poisonous. The latter point was definitely ascertained by Dr. Wolff, of Philadelphia, by physiological experiments conducted at Jefferson Medical College. It is soluble in 1,000 parts of water at 60° F., and 100 parts at 212° F., from which the excess separates on cooling in beautiful brown feathery crystals. The saturated solution (1 in 1,000) has a slight aromatic odor, but it is practically tasteless. In somewhat stronger warm solutions, it has a bitterish, pungent taste. It sublimes at 90° C. It occurs in silvery white pulverulent laminæ, and dissolves in 4 parts of alcohol, 3 parts of ether, and about 10 parts of cotton-seed oil. The latter requires the heat of a water-bath, but remains permanent on cooling. All these solutions show a black sediment on standing, probably some tarry impurity, which will be gotten rid of as the process of manufacture is improved. It dissolves in 10 parts of glycerin at the heat of a water-bath, but is almost entirely recrystallized on cooling, and remains suspended for days. It is stated by the manufacturers to be freely soluble also in chloroform and benzol. These I have not confirmed, but from the nature of it, it seems probable. Hydronaphthol is not germicidal, at least in the proportion of 0.5 in 100 parts, or five times the strength of a saturated aqueous solution, but it is reliably antiseptic in proportion of 0.1 to 0.05 per cent, preserving solutions of beef, glue, gelatin, starch, gums, and fresh urine, etc. Thinking that so valuable an antiseptic must prove useful in various ways in pharmacy, I have been testing it during the summer, and noted the following behavior to reagents. In all cases, the saturated aqueous solution was employed. This solution exposed to sunlight soon begins to darken, passing through various shades of opalescence, becoming brown after a month or so, and depositing a film on the entire inner surface of the bottle.

With Tinct. Chlor. Iron:	No change resulted.
With Tinct. Iodine:	Discharged color of first two or three drops, but became opaque on further addition.
With Ammonia:	Light purplish tinge, changing to straw color after some hours.
Sol. Potassa:	No change.
Acid Tannic:	No change.
" Salicylic:	No change.
" Acetic:	No change.
" Sulphuric Conc:	No change.
" Hydrochl. "	No change.
" Phosphoric "	No change.
" Nitric "	An orange-yellow color, changing in a moment to a dense turbid olive-green by transmitted light, and dull purple by reflected light.
Acid Nitro-Hyd'chl. Conc:	Same as Nitric.
" " " dil.:	No change.
" Nitric "	No change.

Among the first uses to occur to the pharmacist will be the preservation of alkaloidal solutions. I have prepared some for trial, but they are too recent to prove anything at this meeting, being only made within three weeks. But I think that a solution of hydronaphthol, say five to seven grains to a pint of distilled water, will furnish a perfect basis for delicate solutions. I have noted, however, one exception. Sulphate of strychnine is decomposed and probably reduced to the alkaloid. The use of hydronaphthol will enable pharmacists to prepare fresh beef juice by sprinkling on the finely chopped beef a little of the powder, say ten grains to the pound; warm over a fire to about 130° F., and press quickly. The product would contain all the albumin and be infinitely better than the commercial meat extracts. The physician would best appreciate this after restoring a patient from extreme debility.

* Read at the meeting of the A. P. A., at Providence, September 7th to 10th, 1886.

To Remove Freckles, a writer in the *American Practitioner and News* recommends the following treatment: The skin being washed and dried, is stretched with two fingers of one hand, while a drop of carbolic acid is applied exactly over a discolored patch. When it dries, the operation is completed. The skin becomes white, and the slight sensation of burning disappears in a few minutes.

TARTARIC acid is a remedy for profuse sweating of the palms. It can be used in powder or solution, four or five times daily, and should be allowed to remain in contact with the surface as long as possible.

CONCENTRATED PREPARATIONS.*

BY J. L. LEMBURGER.

THIS subject has been accepted with a full knowledge that there is more or less prejudice against the use of concentrated preparations, the dilution of which shall represent the weaker preparation of the pharmacopœia; such prejudice or opposition, as far as I can ascertain, is based not so much upon the impracticability of the plan, as upon the lack of pharmaceutical integrity in the preparation of the concentrated preparation, and, in the writer's judgment, this thought might form a topic for investigation if equal importance to the query is presented. Numerous trials were made, not in the way of modifying the pharmacopœia formulæ at all, but rather to accommodate demand coming from a certain class of patrons. I find that from an honestly prepared fluid extract, say, for example, fluid extracts of ergot, aconite root, nux vomica, a wine or tincture can be prepared, answering in all respects to and filling the requirements of the officinal tinctures. It is true that the same therapeutic result will in most cases be attained by administering either one of the named preparations in a correspondingly similar dose, yet in the use of say tincture of aconite, or any other of the powerful preparations sometimes used for outward applications in liniments or washes, there can, in our judgment, no deterioration occur by such dilution; it has been frequently tried with fluid extracts of known purity and of careful home manufacture. There are still physicians who, in ordering the wine of ergot, stipulate that they *want* it made with the fluid extract as of old, although it is no longer the officinal process for its manufacture.

Infusions may be more readily made with a concentrated preparation, and are unquestionably quite as good therapeutically as those made by the required process of maceration for one or more hours. The writer has been in the habit of thus making the compound infusion of gentian, and although it is not an officinal preparation at this time, it was formerly, is frequently prescribed now, and should have been kept in the pharmacopœia. In my judgment, a concentrated preparation, such as one to which reference is made in the last edition of the U. S. dispensatory, page 795), is not only justifiable, but in every way practical and feasible.

Some pharmacists having country physicians' trade are frequently called on for an infusion of gentian, or perhaps digitalis or quassia, and it is wanted in less time than the officinal process will allow it to be made, and with the physician's consent have on numerous occasions accommodated such want by making from the fluid extract in the required proportion.

In answer then to query 100, it is my judgment that it is quite feasible to prepare concentrated liquid preparations of some drugs which may be diluted so as to bring them to the officinal strength. They might have to be specifically designated, say concentrated liquid of gentian for infusion, etc., and care would have to be taken in the proper adjustment of the menstruum.

Extract of Sweet-pea is said to be a homœopathic remedy for diabetes.

* Read at the meeting of the A. P. A., in answer to query 100: "Is it not feasible to prepare concentrated liquid preparations from many drugs, which need only be diluted with the appropriate menstruum to bring them to the officinal strength, without having them differ in any important point from the weaker preparations directed by the U. S. Pharmacopœia?"

SPIRIT OF NITROUS ETHER.

BY EMLEN PAINTER, OF NEW YORK.

BEING engaged a few years since in the manufacture of different ethers on a considerable scale, and, in studying the subject, desiring to find a practical method for making muriatic ether (which eventually proved eminently successful), it became clearly manifest to my mind that spirit of nitrous ether was not made by a proper, or, at least, by the most rational method. However, when I began to consider the very general use of this article throughout America as well as Europe, the immense quantities of it produced, the very able men who have experimented with it in the different manufacturing establishments, and the amount of literature we have on the subject, I concluded that my plan was probably impracticable—though for reasons not then apparent to me—and that it must have been tried on a manufacturing scale and found wanting.

It is stated in Fownes' Chemistry, as well as in other works, that the *only* method of making *pure* nitrous ether, is a different one from the methods in use in all manufacturing establishments (so far as I know) and different from that of the pharmacopœia. To satisfy my mind on the subject, and if possible to turn out a better product, I began experimenting, but was compelled to interrupt my investigations for a time, and have only recently been able to resume them.

Although working at great disadvantage in not having sufficient time to devote to it, or suitable room or appliances, I beg to present my ideas, with a review of the experiments I have made, and deductions therefrom, trusting that they may assist in some degree in supplying pharmacy and medicine with a better article of spirit of nitre.

It is, I believe, an universally accepted fact that a mixture of nitric acid and alcohol with sufficient heat applied to cause a reaction, invariably produces, besides nitrous ether, some aldehyde, ethyl nitrate, and other nitrogenous products contaminating, to a greater or less degree, the distillate of nitrous ether from such a mixture, varying according to the temperature maintained, the changing strength of the alcohol as the operation proceeds, and the quantity of material acted upon. The separation of pure ethyl nitrite from this distillate, especially from the aldehyde, is so difficult a task, that there is probably not a sample of spirit of nitre in the market that does not contain more or less of this impurity.

Then why mix the nitric acid at all with the alcohol, when by first reducing the acid to nitrous anhydride, and passing this gas into alcohol under favorable circumstances, ethyl nitrite free from aldehyde is produced? I do not claim any novelty in this way of making nitrous ether, as before inferred, and I cannot conceive how it is that a working method after this plan has not long since been brought into successful operation by the manufacturers of this ether.

Before detailing my plan of manipulation (which is very simple indeed), let me point out more particularly some of the objections to the present methods. The first step in the reaction between alcohol and nitric acid to form nitrous ether is necessarily a deoxidation of the acid; the alcohol being the reducing agent, is consequently oxidized, thereby forming aldehyde in the very first stage of the process, as well as nitrous acid and water, as is more clearly shown by the following equation:

$$\underset{\text{alcohol}}{C_2H_6O} + \underset{\text{nitric acid}}{HNO_3} = \underset{\text{aldehyde}}{C_2H_4O} + \underset{\text{water}}{H_2O} + \underset{\text{nitrous acid}}{HNO_2}$$

Then with a second molecule of alcohol the reaction with the nitrous acid in its nascent state forms nitrous ether.

$$\underset{\text{alcohol}}{C_2H_6O} + \underset{\text{nitrous acid}}{HNO_2} = \underset{\text{ethyl nitrite}}{C_2H_5NO_2} + \underset{\text{water}}{H_2O}$$

The temperature at which it is formed, however (between 150° and 200° F., or the temperature required to produce a reaction with nitric acid), is far above that which is necessary to form nitrous ether with the resulting nitrous acid; other nitrogenous compounds are consequently simultaneously formed, or else a portion of the ether is immediately split into other combinations, nitric oxide gas being one of the results, which gas can readily be detected at the exit of the condenser. Hydrocyanic acid is also possibly produced beside the aldehyde, as well as acetic acid and acetic ether, all of these products having been found by different experimenters in samples of nitrous ether made by this method. In regard to the aldehyde first formed, I am aware of the theory that it reacts with another molecule of nitric acid, forming acetic acid and nitrous acid:

$$\underset{\text{aldehyde}}{C_2H_4O} + \underset{\text{nitric acid}}{HNO_3} = \underset{\text{acetic acid}}{C_2H_4O_2} + \underset{\text{nitrous acid}}{HNO_2}$$

the latter acid being utilized as the molecule first formed.

This or some similar reaction is undoubtedly the case, otherwise the distillate of nitrous ether would be contaminated by aldehyde in a far greater degree than it is; but the aldehyde is not all decomposed; more or less of it distils over, and is condensed with the ether. The boiling point of aldehyde is 71° F., whilst the boiling point of alcohol is 173° F. A considerable quantity of the latter always distils over with the ether, so that it is reasonable to infer that aldehyde distils with it as well.

The use of copper, first recommended by Prof. Redwood, with the view of supplying a reducing agent for the nitric acid without resorting to the alcohol present, appears at first a very plausible theory, but in practice it certainly does not merit the distinction it has attained. In my opinion, it is worse than useless, or, rather, the disadvantages overbalance by far the advantages derived from its use. It fails in its object (the supplying of nitrous acid), and works an advantage only mechanically in regulating the action in the retort, which seems to proceed more regularly with it, and possibly at a somewhat lower temperature. This same end can be attained, however, by the use of sulphuric acid alone, or of sand, glass, fragments of pumice stone, etc., as shown by different experimenters.

In my experience, by careful manipulation, a larger yield of nitrous ether can be had from a given quantity of alcohol and acid *without* the copper *than* with it.

The theory of the formation of nitrous acid from the mixture of copper, nitric acid, and sulphuric acid looks very pretty:

$$\underset{\text{nitric acid}}{HNO_3} + \underset{\text{copper}}{Cu} + \underset{\text{sulphuric acid}}{H_2SO_4} = \underset{\text{copper sulphate}}{CuSo_4} + \underset{\text{water}}{H_2O} + \underset{\text{hyponitrous acid}}{HNO} + \underset{\text{nitrous acid}}{HNO_2}$$

but in practice, I think like this:

$$\underset{\text{nitric acid}}{8HNO_3} + \underset{\text{copper}}{3Cu} = \underset{\text{copper nitrate}}{3Cu(NO_3)_2} + \underset{\text{water}}{4H_2O} + \underset{\text{nitric oxide}}{N_2O_2}$$

the sulphuric acid coming in afterwards, and merely displacing the nitric acid in the copper compound. At all events, it is a known fact that nitrogen dioxide gas (N_2O_2) is evolved, giving off red fumes in contact with the air, when copper and strong nitric acid are brought together.

The nitrogen dioxide formed in the retort passes through the condenser, and escapes, carrying with it a very considerable quantity of the vapor of nitrous ether, no matter how extensive and well-cooled condensing surfaces one may have. I was told by one manufacturer that his Liebig's condenser extended the whole length of a large room, fifty feet or more, and still ether escaped uncondensed. I have passed the distillate of crude ether—using copper in the process—through sixty feet of coil, surrounded from one end to the other with a freezing mixture of ice and salt. So cold indeed was the condenser that before the operation was finished the coil filled up with ice, by abstracting the moisture, and yet more or less of the ethereal vapor escaped. This is explained by the fact that nitrogen dioxide is being formed continuously, and, not being condensible, carries with it mechanically some of the ether vapor, on the same principle that in starting the distillation of a very volatile liquid (as doubtless we all have observed) uncondensed vapors will escape at first, and that condensation is not complete untill all the air is expelled.

In view of the foregoing facts, and the deductions made therefrom, it appears to me that a more rational method of making nitrous ether would be to first reduce the nitric acid to nitrous anhydride by the agency of cotton, starch, arsenious acid, or other suitable reagents; then pass this gas, freed as nearly as possible from nitric acid, into a mixture of alcohol and water maintained at a temperature of about 100° F., the vessel being connected with a well-chilled condenser, and having the receiver surrounded by ice and water.

This method greatly simplifies the chemical reaction, and from my experiments I am led to believe that it is quite practical on a manufacturing scale, that the yield of ether is increased over the present method from 50% to 100%, that it is more economical, and, most of all, that an ether is produced free from aldehyde and acetic ether, and almost absolutely pure when first made.

The chemical reaction may be explained thus: Nitrous anhydride gas, on being passed into water, forms nitrous acid, which acid, however, cannot exist in aqueous solution, and is immediately resolved into nitric acid, nitrogen dioxide, and water, as shown by the following equations:

$$\underset{\text{nitrous anhydride}}{N_2O_3} + \underset{\text{water}}{H_2O} = \underset{\text{nitrous acid}}{H_2N_2O_4}$$

$$\underset{\text{nitrous acid}}{3H_2N_2O_4} = \underset{\text{nitric acid}}{H_2N_2O_6} + \underset{\text{water}}{2H_2O} + \underset{\text{nitric oxide}}{2N_2O_2}$$

If, however, alcohol be present in sufficient quantity, the nitrous acid ($H_2N_2O_4$) reacts with it, forming ethyl nitrite and water:

$$\underset{\text{alcohol}}{2C_2H_6O} + \underset{\text{nitrous acid}}{H_2N_2O_4} = \underset{\text{ethyl nitrite}}{(C_2H_5)_2N_2O_4} + \underset{\text{water}}{2H_2O}$$

and if the alcohol be maintained in the right proportion, but little, if any, nitric acid and nitrogen dioxide are formed.

It is unnecessary to give in detail the series of experiments made; yet it may be interesting to review briefly the steps taken.

In my first experiment, made in San Francisco some years ago, I used cotton to reduce the nitric acid to nitrous anhydride. The acid and cotton were put into a flask, placed over a gas

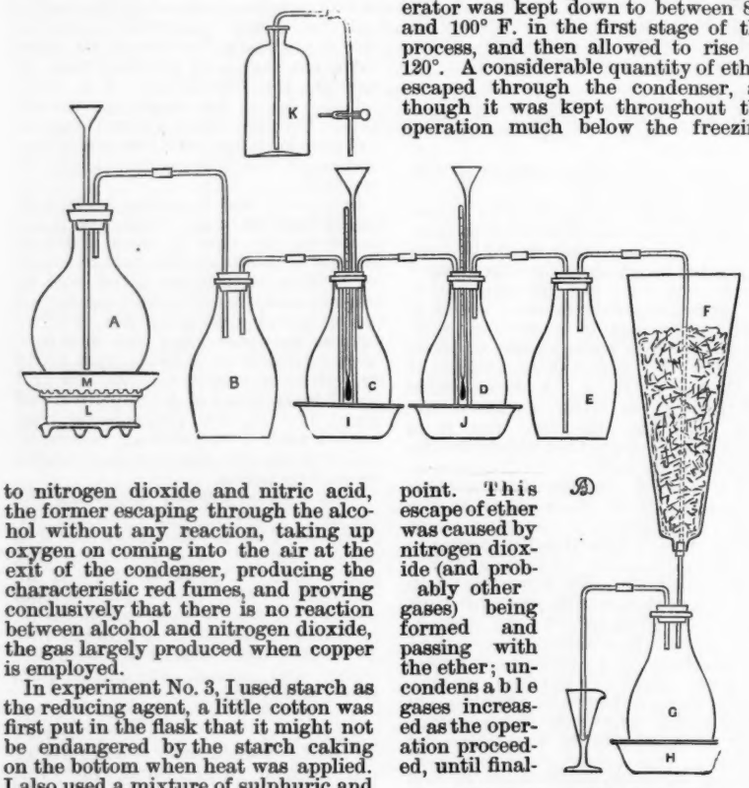
burner, and connected by a bent tube with a bottle containing alcohol of about 70%, and this bottle in turn connected by a bent tube with a condenser filled with ice and water. Heat was applied to the flask to establish a reaction; the evolution of gas was too rapid, and the reaction with the alcohol was so violent that it became in a very short period beyond control, although I kept the bottle surrounded with cold water; so great was the heat produced that nearly all of the liquid distilled over spontaneously, and much of the ether was lost. The distillate was found to be strongly acid, and to have separated in two layers. The ethereal layer was then removed, and found to be extremely volatile, boiling at the temperature of the room, the thermometer standing at about 65° F.

In my second experiment, I thoughtlessly interposed a wash bottle, containing water, between the acid generator and the alcohol, and consequently did not get any ether, the water reducing the nitrous anhydride to nitrogen dioxide and nitric acid, the former escaping through the alcohol without any reaction, taking up oxygen on coming into the air at the exit of the condenser, producing the characteristic red fumes, and proving conclusively that there is no reaction between alcohol and nitrogen dioxide, the gas largely produced when copper is employed.

In experiment No. 3, I used starch as the reducing agent, a little cotton was first put in the flask that it might not be endangered by the starch caking on the bottom when heat was applied. I also used a mixture of sulphuric and nitric acids, with the view of taking up water with the former acid, and also of making the evolution of gas more regular. In these particulars it was successful. In the wash-bottle before mentioned, I put a little strong alcohol (which was a mistake), but on the whole I was gratified with the outcome of the experiment, and I felt more fully convinced that it was simply a matter of repeated trials, to devise a practical process of making pure nitrous ether after this plan. The result was seven fluidounces of nitrous ether from one pint of alcohol diluted with four ounces of water. A larger yield might have been obtained had the distillation been carried further. This ether produced no discoloration of aqueous potash, even after standing mixed with it for several days.

Experiment No. 4 was a failure. Sulphuric acid was used in the wash bottle, and 93% alcohol in the ether generator, which was kept cooled as in my other experiments. The alcohol eagerly absorbed the nitrous anhydride gas, but very little ether distilled; when the alcohol approached saturation, I allowed the temperature to rise until active effervescence ensued. I then tried to control the reaction by surrounding the generator with ice water, crushed ice, and salt, yet it still increased to such violence, that the ether vapors and gases formed were forced through the condenser without condensing, and much of the liquid from the generator was spurted out through a safety tube, which I had fortunately provided; otherwise there doubtless would have been an explosion. In the receiver were found four or five ounces of an acid liquid with a half-ounce or more of ether floating on the surface, the whole of which I consigned to the sink in disgust.

In experiment No. 5, which was conducted with great care, a mixture of sulphuric and nitric acids was used, and cotton added to generate the nitrous anhydride; the wash bottle was left empty, the ether generator contained a mixture of three parts of alcohol and one of water, with a thermometer inserted in it, the condenser and receiver were surrounded with ice and salt. The flask was then carefully heated, and the evolution of gas was quite regular. Ether began to distil at once, the temperature of the generator was kept down to between 80° and 100° F. in the first stage of the process, and then allowed to rise to 120°. A considerable quantity of ether escaped through the condenser, although it was kept throughout the operation much below the freezing point. This escape of ether was caused by nitrogen dioxide (and probably other gases) being formed and passing with the ether; uncondensable gases increased as the operation proceeded, until finally they were formed to the almost entire exclusion of nitrous anhydride. The heat was then withdrawn. This experiment demonstrated that cotton was not a suitable deoxidizing agent, used in this manner. From a pint of alcohol, the yield was about thirteen ounces of distillate, which separated in two layers, about three-fourths of it being the ethereal layer.



Painter's Nitrous Ether Apparatus.

A, half-gallon flask with rubber stopper; B, quart bottle with cork stopper; C, quart bottle with cork stopper, thermometer, and long-necked funnel. (This is the ether generator.) D, duplicate of C; E, quart bottle with cork stopper; F, condenser; G, receiver; H, I, J, pans in which the bottles are placed; K, reservoir for alcohol; L, gas-stove; M, sand-bath.

Experiment No. 6 was conducted in the same manner as the preceding one, but arsenious acid was used in place of the cotton, and another bottle containing water and magnesia was interposed between the ether generator and the condenser. The result was highly satisfactory, the condensation was complete, and the yield of ether was over ten ounces from thirteen ounces of alcohol used. This ether did not perceptibly diminish in volume on being shaken with cold water, and did not change or deepen in color when shaken with aqueous potash.

The chemical reaction may be thus explained:

$$As_2O_3 + 2\,HNO_3 = As_2O_5 + H_2O + N_2O_3$$

arsenious anhydride	nitric acid		arsenic anhydride	water		nitrous anhydride

the N_2O_3 passing into the water and alcohol in the ether generator, and there reacting as explained in a previous equation.

The important question now arises—is this ether contaminated in any degree by the arsenic used in the process? On applying the simpler tests, they gave no indications of any being present. Being desirous, however, of having my work corroborated on this point, I took a sample of the ether to our fellow-member, Dr. Rice, who kindly examined it, and reported that the sample examined by him was free from every trace of arsenic.*

Without reviewing further my experiments, I respectfully submit the following working formula for making nitrous ether, which I find to be quite practical in a small way, and I think it will be found even more applicable on a large scale, simply increasing the size of apparatus, and the quantity of materials acted upon.

In the accompanying cut, A is a half-gallon glass flask, fitted with a rubber stopper, through which passes a bent tube and a long-necked funnel, the latter reaching nearly to the bottom of the flask. B is a quart bottle also fitted with a perforated rubber stopper, with two bent glass tubes passing through it. C is the ether generator, a quart bottle fitted with a cork stopper, through which pass two bent glass tubes (one reaching nearly to the bottom), a long-necked funnel and a thermometer. D is a duplicate of C. E is the same sized bottle, fitted as the others with a cork stopper and two bent glass tubes. F is the condenser which consists of a cylindrical vessel (designed for a percolator), three feet in height, with a bent glass tube passing down through it as shown in the cut. G is the receiver. H, I, J are three pans in which G, D, and C respectively sit. K is a reservoir for alcohol with a small rubber tube supplied with a pinchcock, and leading to the funnel of C. L is a gas-stove on which is resting the sand bath M. The bent tubes of the several pieces of this apparatus are joined by short sections of rubber tubing. The bent tubes of A and B, and the one passing to the bottom of C are ⅜ in. in diameter, the others are ½ in. or larger. The apparatus is charged by introducing into the flask A 1½ lbs. of strong sulphuric acid, then adding very carefully (to avoid breaking the flask) 2¼ lbs. of arsenious acid in lumps the size of a hazelnut and under. In the bottle E is put 8 ounces of water and about ¼ ounce of bicarbonate of sodium, the connections are then made throughout.

A section of rubber tubing makes a perfectly water-tight joint around the glass tube passing through the bottom of the condenser. The corks should have a liberal coating of plaster-of-Paris extending down the necks of the bottles, to insure their being perfectly tight. The condenser is then to be filled with finely crushed ice and a slight sprinkling of salt, and sufficient water added to fill up the interstices. The pan H, in which the receiver sits, is also to be filled with crushed ice. Two and one-half pounds of nitric acid (sp. gr. 1.42 or stronger) is now introduced through the funnel of the flask A; the bottle B is left empty; into C is introduced through the funnel twelve ounces of alcohol and four ounces of water, and half the quantity of the same mixture is put in D. A tub of

* It should be pointed out that the only likely source of arsenical contamination in the product would be the presence of hydrochloric in the nitric acid, which would result in the formation of volatile chloride of arsenic.—Ed. Am. Drugg.

broken ice is provided for use as the operation proceeds, and one pint of strong alcohol is put into the reservoir. Heat is applied to the flask A, and regulated so that there will be a free and constant evolution of gas; the temperature of the generators C and D respectively is allowed to rise to 80° F., then they are immediately surrounded with cold water, and lumps of ice added to the pans from time to time to maintain the temperature between 80° and 120° throughout the operation. The bottle D is merely a precautionary provision in the event of the evolution of nitrous anhydride gas becoming so rapid in any stage of the process that it is not all taken up in C, when the remainder may be caught and utilized in D. At the close of the process, D may be surrounded with hot water to distil off any ether that may remainabsorbed by the alcohol in it; this bottle, however, might possibly be as well dispensed with. E serves a good purpose, the water absorbing any alcohol that may pass into it, and the design of the bicarbonate of sodium is to take up any free acid there may be in the vapor as it passes, in which case the elimination of carbonic acid gas is, of course, objectionable; if the same object could be accomplished by an oxide it would be preferable. I find that caustic lime, potash, or soda does not answer, for the reason that they all decompose the ether. Magnesia or oxide of zinc does not seem to affect the ether, nor does it remove the acid completely.

As soon as the ether begins to drop from the condenser, the pinchcock on the tube leading from the reservoir is opened sufficiently to admit of about the same quantity of alcohol flowing into the generator C as there is ether passing into the receiver. In about three hours' time the operation will be concluded, and there will be found in the receiver twenty to twenty-five ounces of pure nitrous ether. On a larger scale the yield, of course, would be considerably greater; by this continuous process there would be left in the generator proportionally less alcohol, and by recovering the alcohol from the residues to be used in a subsequent operation, almost the theoretical quantity of ether might be obtained. At least, calculation shows that 100 parts of absolute alcohol can readily be made to yield 120 parts of ether. In my experience, *pure* nitrous ether is too volatile a product to be handled except in the laboratory of the manufacturer, and it, therefore, should never be sent out to the dispensing pharmacist. If there be a commercial demand for a more concentrated spirit than the officinal, I would recommend that the pure ether be diluted with at least three times its weight of alcohol, thus making a 25% solution, then one part of this to four of alcohol would make the officinal spirit of nitrous ether. In my opinion, however, it would be still better to at once dilute it to the officinal standard. If it is desired to preserve the ether in its pure state, I think it should be perfectly dried by passing the vapor through a proper dehydrating agent (fragments of fused chloride of zinc in a tube would probably answer), and then be immediately put into small, well-filled glass-stoppered bottles, the stoppers smeared lightly with glycerin before being inserted, and securely tied down and kept in a cool and dark place.

I desired to have presented with this paper a more minute description of the character and properties of the ether produced by this method, in comparison with the ether made by the method of the pharmacopœia, but the summer weather being so unfavorable to investigations of such volatile products, my experiments are as yet too incomplete to give a satisfactory report on these points.

DOES CANNABIS INDICA CONTAIN NICOTINE?*

BY GEORGE W. KENNEDY.

In the year 1876, Preobraschensky claimed to have obtained nicotine from Bucharian hashish, and also from gunja. After this announcement was made, several chemists experimented with the drug, Indian hemp, with a view of isolating the nicotine, but I believe they were unsuccessful in their efforts, even after repeated examinations were made.

For the extraction of the alkaloid nicotine from the herb Cannabis indica, the acceptor of this query concluded to submit the drug to two different and separate treatments, the object for doing so being that, in case one manipulation should fail, the other might be tried. Besides, there would be stronger evidence of the presence or absence of the base in search of.

It is well known that the alkaloid nicotine is not a permanent base, but quickly assumes a brown color on exposure to the air and light, and is partly converted into a resinous compound and, according to good authority, it appears even to undergo an alteration by repeated distillation in an atmosphere deprived of oxygen. Therefore, it is easy to realize the necessity of observing many little points apparently trifling, but yet of much importance in pursuing an investigation of this character, so as to obtain satisfactory and conclusive results.

A failure to observe any one of them, in all probability, would give quite contrary conclusions.

In order to make myself feel more satisfied with my work, I decided to work on tobacco for nicotine at the same time, the treatment being precisely the same in every particular and detail, so that if I succeeded in obtaining the alkaloid from tobacco, by either or both of the processes, then there should be no reason, if it was present, why I should not be successful in extracting it from the Cannabis indica.

In the one process I prepared an alcoholic extract of each by moistening the powdered drug with alcohol, packing in a conical glass percolator, and after allowing it to stand in this condition for twenty-four hours, pouring alcohol on the packed drug, until it was extracted, paying strict attention so that percolation would proceed slowly. The first third of the percolate was reserved, the remainder evaporated at a temperature not exceeding 50° C. (122° F.), to a proper consistence, the reserved portion added, and the whole evaporated to a pillular mass. In each case two pounds of the drug were used, with the following yield of extract:

Tobacco, $3\frac{1}{8}$ ounces.

Cannabis indica, $3\frac{1}{4}$ ounces; the former $9\frac{5}{10}$ per cent, and the latter 10 per cent.

Dragendorff states that nicotine may be readily obtained by means of ether, chloroform, benzol, or petroleum benzin. The extract of each drug was therefore treated with a small quantity of alcohol and acidulated with sulphuric acid, after which water was added and the alcohol evaporated.

The resinous matter set free was separated by filtration; the acid filtrate was then agitated with ether, and the watery acid liquid separated and rendered alkaline by potassa, and again agitated with ether. The ether would now take up the alkaloid nicotine if present, and it could be obtained by spontaneous evaporation. Since, however, the alkaloid is easily altered, only a portion of the ethereal solution was evaporated, the object of which was to procure a small quantity of the pure nicotine. In evaporating the last traces of ether present from the almost colorless base, I discovered that the alkaloid was undergoing a change, as it soon showed signs of decomposition, by slowly changing to a dark brown color. The second portion was converted into a salt by agitating with slightly acidulated water (H_2SO_4), first driving the ether off, and afterwards evaporating the watery liquid. In the above examination, the Indian hemp gave negative results, but when a solution was tested with the general alkaloid reagents, such as the potassiomercuric iodide and phosphomolybdic acid, a very faint precipitate was perceptible.

The second process was conducted by exhausting the bruised drug with acidulated water, by evaporating this acidulated liquid to a small bulk, and then distilling with a solution of caustic potassa, the distillate neutralized by dilute sulphuric acid to combine with any alkaloid present, and the slightly acidulated solution tested with the alkaloidal reagents in order to ascertain whether an alkaloid is really present or not. As in the preceding experiment, a faint indication of the presence of an alkaloid was shown by a very light precipitate. The neutralized solution as obtained above was then evaporated to dryness on a water-bath, and treated with absolute alcohol, in order to separate any ammonium sulphate with which it might have been contaminated. The alcoholic liquid which would contain the nicotine sulphate was evaporated to the crystallizing point, when a small group of crystals were obtained. By dissolving the crystals in water, making the solution strongly alkaline with caustic potassa, and finally shaking with ether, the ether, upon evaporation would leave the free base in quite a pure state.

In this second examination I failed to obtain nicotine from Cannabis indica, but was successful with the tobacco.

In concluding my work on this query, I would answer it by saying that nicotine is not present in Cannabis indica in accordance with my investigations, but there is strong evidence of an alkaloid of some kind, as the tests above referred to would indicate.

Late investigations by others point in the same direction.

* Read before the Amer. Pharm. Assoc., in answer to query 97.

Lanolin as a Basis for Ointments.—In a preliminary note in the *Russkaia Meditzina*, No. 12, 1886, p. 207, quoted in the *London Medical Record*, Dr. L. K. Pavlovsky, of Kharkov, writes that his experiments with Liebreich's lanolin (first in Russia) enable him to arrive at the following conclusions: 1. Narcotic extracts, when combined with lanolin, are absorbed by the skin "quite satisfactorily," their pain-relieving action being obtained "with an almost perfect certainty." The dose used was only twice as large as that for internal use. 2. Hydrochlorate of quinine is absorbed also very easily. This statement is based on four cases of intermittent fever in children, where lanolin and quinine inunctions rapidly gave the effects desired. 3. When a lanolin ointment, with iodide of potassium, is rubbed in, iodine appears in the urine not sooner than two, four, or six hours after inunction, while Lasser obtained iodine from the urine about three minutes after friction. 4. In children, lanolin is better absorbed than in adults. 5. Washing the skin with ether considerably facilitates the absorption of lanolin ointments. 6. In general, lanolin is a substance which promises to supersede all other constituents for ointments, and even, in certain cases, to render superfluous the internal use of drugs.

EVAPORATION OF PERCOLATES.*

BY PROF. J. U. LLOYD.

In a series of papers preceding this one, I have referred to certain conditions that influence favorably or unfavorably the act of percolation. Passing now to the percolate, which we usually have to concentrate, in whole or in part, by evaporation in making the various pharmaceutical preparations, I will introduce a subject that we also must take into consideration in order to produce uniform results at different times and when working varying quantities.

In making fluid extracts and many other preparations, we have to evaporate reserved percolates, or entire percolates. It is generally accepted that a protracted application of heat to liquid preparations of vegetable origin is to be avoided, and in many instances it is certainly necessary to employ but little, and often to avoid any heat. In this paper, I shall not consider the effect of the use of heat in individual percolates, but shall call attention to a feature of general application, and which is scarcely, if at all, considered by pharmacists. It involves the preparation of many substances, and may prove of interest to pharmacists who have overlooked this phase of the subject.

In making the officinal amounts of fluid extracts, we usually have varying, but small bulks of percolates to concentrate to a certain amount. Many of us have reason to increase the officinal quantities, and perhaps few pharmacists conform literally to the amount of drug specified in the pharmacopœia. The problem I bring forward is, can an increase or decrease of the amount of material cause a variation in the product, provided the proportions of all substances are maintained? For the sake of argument, we will admit that in all operations the act of percolation is complete and uniform.

That an increase of proportions may make a difference in the product is evident to all who have reason to increase amounts from time to time. Often many times the original formula is employed, and that such an increase will make a variation in the quality of the evaporated product, from the application of excessive heat alone, can, I think, be conclusively demonstrated.

I will take, as an example, a substance in which the variation can be made apparent to the eye.

If fifteen fluidounces of vinegar of squill be evaporated to one fluidounce, does it follow that this product is identical with like amounts of the product that results from the evaporation of thirty fluidounces to two fluidounces, the same temperature being maintained in each instance? Continuing, will the resultant liquid remain uniform, when batch after batch is doubled, provided that the product is also each time doubled, thus maintaining the proportion? In reply, I submit as samples, in vials of uniform diameter:

No. 1. From seven and one-half fluidounces of vinegar of squill evaporated to one-half fluidounce.

No. 2. From fifteen fluidounces evaporated to one fluidounce.

No. 3. From thirty fluidounces evaporated to two fluidounces.

No. 4. From sixty fluidounces evaporated to four fluidounces.

No. 5. From one hundred and twenty fluidounces evaporated to eight fluidounces.

The evaporation was conducted in porcelain dishes of the usual dimensions. The temperature varied but little from 175° F. to 180° F.

It will be seen that the specimen that I submit, representing the smallest amount of drug, is a light amber color, but darker than the vinegar of squill used in making it, and that each successive batch increases in color with the increase of material, until a dark brown-red is produced. It will also be found that the odor varies from a pleasant dilute acetic acid in the small amount to that of a burnt cracker in the larger, and it is also true that the flavor of successive batches becomes more foreign to prime squill as there is an increase of material worked. Thus it is evident that there is a variation in product with each increase of batch, even though in all instances the same formula is followed, for, in all these experiments, filtered vinegar of squill from one batch was employed.

In explanation of the apparent inconsistency, a little thought will show us that the conditions were changed in each experiment, although the same process was followed, and that no two batches were submitted to the same application of heat.

	Time required.	Size of dish.	Surface of liquid before evaporation.	Surface of liquid after evaporation.
No. 1	160 min.	12 oz.	5 in. in diam.	3½ in. in diam.
No. 2	180 "	32 "	6¾ " " "	3½ " " "
No. 3	400 "	32 "	7⅜ " " "	5 " " "
No. 4	470 "	128 "	9⅜ " " "	6 " " "
No. 5	745 "	128 "	11½ " " "	7⅛ " " "

The increase of evaporating surface in the usual evaporating basins, as we pass to larger dimensions, is not sufficient to produce a uniform product when proportions are increased accordingly. Therefore it follows that, with substances injured by a continued application of heat, we must take into consideration the fact—for it is undeniable—that a conformity to the officinal process may be only apparent and not practical. I have selected as an illustration a substance in which a change produced by heat is perceptible to the eye. It is not more clearly defined, however, than is the case in many other bodies that have come under my consideration, where I have been forced to increased batches, often to a thousand pounds or more, and I am not as enthusiastic as some persons are regarding the injury following the application of a moderate heat to the majority of products from dried plants. There is no doubt, however, that in many cases a continued application of heat (simply from an increase of quantity, and where the operator really thinks he will make a substance to conform with the pharmacopœial requirements) may result in a product that, in many respects, would be entirely different from that made if the officinal amounts were followed. The application of this rule is general, and, when the conditions of the apparatus are similar, favors the pharmacist who follows the U. S. P. amount rather than the manufacturer who uses the U. S. P. process, and applies it to large quantities. Doubtless all of us have been confronted with this problem by an observance of the change following the variation in batches, but, perhaps, we passed it by as unimportant, or argued that a like process must produce like results. Many arguments have been advanced as to the advantages or disadvantages of operators on a large or small scale, but as yet I have to find the first claim by the pharmacist who works in pharmacopœial amounts of the advantage he has as introduced in this paper.

In another paper* I speak of a fluid extract of squill, and say that the product "ranges from light amber to dark brown-red in accordance with conditions of the evaporation." Herein I have shown that the larger the amount employed, the more objectionable the product. By the usual methods of evaporation, that formula is only applicable to small amounts, and cannot be employed in making large batches.

* Paper read at the meeting of the Am. Pharm. Assoc. at Providence, R. I.

* This paper was not read at the meeting, as had been intended.—Ed. Am. Drugg.

PASTE FOR LABELS.*

BY LEO ELIEL.

This query upon first appearance seems a very trivial one, but when we consider the frequency of the calls for the paste pot in the drug shops, its pertinence is at once apparent. Every pharmacist has his own way of making paste, and though well aware that this article is looked upon as being, in a general sense, hardly worth the time spent upon it for experiments, yet it should receive the same careful attention as matters of greater import. It is the careful attention to those minor matters that prove themselves the main factors to success in our profession and business.

The paste pot, like unto the immaculate towel of the average drug shop, are things to be used, and seldom are found in condition suitable for exhibition in the front window. It is of frequent occurrence to find the paste dried up, and the brush hardened and firmly attached to the bottom of the pot. In our haste to finish some work in hand, we rudely disturb its peaceful rest and fond attachment, and what matters it if we do loosen a few bristles to the annoyance of the next one who may have occasion for its use? Then, again, this same pot develops a well-marked desire and tendency to accumulate its pent up energy on the edges, especially the inner one; this, no doubt, is a kind provision of nature protecting its contents from evaporation, though it rather impedes the easy removal and return of the brush. There are many other peculiar features that might be mentioned in this connection, but time forbids.

There have been so many formulas published for pastes and mucilages (both for labelling), that one would think there was no room for more.

Pastes and mucilages for shop use are best kept in a covered wide-mouthed jar, tall enough to permit the brush to remain inside with the cover on. It should never be allowed to become encrusted with hardened paste, and the brush should frequently be cleaned.

The formulas here presented, with samples, are not original with the writer, but have been in use by him for many years with entire satisfaction.

1. Gum Tragacanth..... 1 oz.
   " Arabic..... 4 oz.
   Dissolve in
   Water..... 1 pint.
   Strain and add
   Thymol..... 14 grains.
   Suspended in
   Glycerin..... 4 oz.
   Finally add
   Water.....to make 2 pints.

This makes a thin paste suitable for labelling bottles, wooden or tin boxes, or for any other purpose paste is ordinarily called for. It makes a good excipient for pill-masses, and does nicely for emulsions. The very small percentage of thymol present is not of any consequence. This paste will keep sweet indefinitely, the thymol preventing fermentation. It will separate on standing, but a single shake will mix it sufficiently for use.

2. Rye Flour..... 4 oz.
   Powd. Acacia..... ½ oz.

* Read before the Amer. Pharm. Assoc., in answer to the query: "What is the best paste for labelling bottles, and how can paste be best preserved?"

Rub to a smooth paste with 8 oz. of cold water, strain through a cheese cloth, and pour into one pint of boiling water. Continue the heat until thickened to suit. When nearly cold add:

Glycerin	1 oz.
Oil Cloves	20 drops.

This is suitable for tin or wooden boxes or bottles, and keeps sweet for a long time.

3. Rye Flour	4 oz.
Water	1 pint.
Nitric Acid	1 drachm.
Carbolic Acid	10 minims.
Oil Cloves	10 minims.
Glycerin	1 oz.

Mix the flour with the water, strain through a cheese cloth, and add nitric acid. Apply heat until thickened to suit, and add other ingredients when cooling. This is suitable for bottles, tin or wooden boxes, and will not spoil.

4. Dextrin	8 parts.
Acetic Acid	2 "
Alcohol	2 "
Water	10 "

Mix dextrin, water, and acetic acid to a smooth paste, then add the alcohol. This makes a thin paste, and is well suited for labelling bottles and wooden boxes, but is not suitable for tin boxes.

AMERICAN CARBOLIC ACID.*

BY EDGAR M. HATTON.

BEARING on the above subject, the following has been obtained: In 1866, encouraged by the experiments of Mr. Crookes with reference to the use of carbolic acid in arresting the cattle plague in England: the demonstration of its value as a constituent in a salve for foot-rot in sheep, and of emulsion for use as sheep dip, and other uses in connection with cattle and sheep raising: by its use as a preservative of raw hides, also by the prevalence of cholera in America in that year, a well-known New York firm commenced the manufacture of carbolic acid on a large scale, and have been constant producers since. For a few years they made no crystals for the market.

The reports of the Paris Exposition, held in 1867, show that at that time no acid was made with a higher melting point than 35° C. by any other manufacturer than Calvert, with the exception, perhaps, of the house of Chas. Lowe & Co., an off-shoot of the house F. C. Calvert & Co. Calvert claimed at that time that their acid, melting at about 40° C., was the only acid that would dissolve in twenty parts of water. To-day any good acid with a melting point even as low as 32° C., will dissolve in sixteen to seventeen parts of water.

This is due to the fact that German manufacturers, instead of purifying the acid by mechanical means, came to the true cause of the difficulty, viz.: the presence of sulphate of picoline, etc., and removed them by proper chemical processes. Perhaps encouraged by this, in 1874, the New York firm commenced the manufacture of crystal acid for the market.

On the foregoing subject, communications were recently addressed to a number of purported manufacturers of carbolic acid throughout the country, but with few exceptions no replies have been received. Considering the manner and style in which the communications were couched, and the way that many have remained unanswered, one is left to infer that the businesses of these parties are not as they would have them seem. Possibly it might have occurred to each that silence on his part might be unnoticed and thereby exposure avoided. In fact, the greater part of the parties claiming to be manufacturers of carbolic acid are either simply distillers of the crude acid oil; refiners of impure acids, mostly foreign; or redistillers of pure imported acids into bottles. This latter process is said to have a decided advantage in adding to the appearance of the crystals. Another class can be added to the above, and while last, we may judge it is not the least, viz., the party with the enterprise to put his own label on another man's product. It frequently follows that those who are enterprising enough to perform this change, charge dearly for their enterprise by adding largely to the selling price. Based on information obtained, there seems to be now only one manufacturer of pure crystal carbolic in America from American coal tar. This firm probably supplies upwards of one-fourth of the crystals and more than one-half of the higher grades of liquid acid used in this country, and is thought to be the only tar distillers in existence anywhere who carry the manufacture to final results. They also use much of the crude material produced by other distillers. In Europe the tar distillers are entirely separate from the acid makers. It is reported that another firm contemplates the manufacture of crystals from American coal tar. One other, some two or three years ago, did produce crystals, but has withdrawn this branch from his establishment.

There seems to be room for further manufacture from American tar, as there was last year a surplus of one hundred thousand barrels, and statistics show that the following number of pounds of acid were imported into this country for the several years named:

Year ending.	*Pounds.*	*Doll.*	*Rat. of Duty.*
June 30, '81,	115,691	48,691	10 per cent.
" '82,	178,842	42,237	10 "
" '83,	1,394,603	46,601	10 "
" '84,	177,395	23,198	Free.
" '85,	461,548	52,288	Free.

This refers to all grades of acids brought into this country, there being no distinction made, as all grades were subject to the same rate of duty. It will be noticed that in 1884 the duty was removed. This disadvantage to American manufacturers is claimed to have been overcome by the decline, about the same time, in prices of caustic soda and sulphuric acid, both of which are quite material in its manufacture. There is no public record of exports, but there is evidence that shipments are made to the West Indies and South America.

In the form of soap, sheep dip, and kindred substances, large shipments are made to South America and frequently by the way of England. A sudden call of late from Japan quite cleared the New York markets of crystals.

It is commonly known that the distillation of coal tar for the purpose of obtaining simply the crude acid is not itself profitable, consequently other ingredients are sought for also. Some of them are produced for the aniline manufacturer, and no doubt the time is not distant when the working of the coal tar oils will be taken up in all of the large cities where gas and coal tar are largely produced, and become a very important industry in this country; then will naturally follow a larger production of crystal carbolic acid, and there is no reason why the foreign article should not be excluded from our market. From further information it is thought without doubt that acids are made in this country, and others perfected from foreign material that fully come up the pharmacopœial standard, and in this respect equals any of the imported articles. One party adds, in regard to their product going beyond this standard, "and this is accomplished without using phosphoric or any other acids to maintain its colorless condition."

Samples presenting indeed a handsome appearance have been received, and were sent in good faith to verify the truth of the statements made in regard to the purity claimed for the goods. From one firm a number of samples taken directly from stock and representing the leading varieties made by them were received.

Following the several numbers will be found a description of the contents of each bottle.

Carbolic acid No. 1, melting point above 36 deg. C.

Carbolic acid No. 2, melting point above 32 deg. C.

Carbolic acid No. 3, common crystal, uncertain as to melting point and color.

Carbolic acid No. 4, 90 to 95 per cent pure phenol, the rest water to keep its liquid at ordinary temperature.

Carbolic acid No. 5, cresol of light color, no impurities save water.

Carbolic acid No. 6, cresol and xylenol, containing some neutral oils and naphthalin, 80 to 85 per cent.

Carbolic acid, 60 per cent crude.

Also a bottle of creasote.

The crude acid is reduced to any strength desired by the trade, even as low as 10 per cent, with the inferior tar products.

These packages, when sold to the trade, are branded with the percentage of acid contained therein. It can be readily seen how the retail trade and the public generally can be deceived in this crude acid after it has passed into second hands.

It is said that the lower dilutions of crude acids are very freely used, and true carbolic acid has had to answer for the dissatisfaction caused by their use.

Much of it is sold without explanation, and people being satisfied with the tarry smell think they have used acid freely, when really little genuine acid has been made use of. If these lower grades had never been used under the name of carbolic acid, the use of the true acid would be greater and its reputation better to-day.

The lower grade acids are not imported into this country.

From the foregoing we find that carbolic acid is made in America that can well be depended on as a medicinal agent, that it can be conscientiously used in dispensing; and, since the low grade acids are strictly American products, would it not be well to encourage the sale of the genuine acid, thereby not only doing the public a good service, but also encouraging the manufacturer by allowing him a further profit in converting these inferior grades into pure crystal carbolic acid in which there is much virtue.

* Read at the meeting of the A. P. A., in answer to query No. 68: "Some notes concerning the carbolic acid made in America."

Ivy Poisoning.

Carbolic Acid	ʒ i.
Strong Ammonia Water	ʒ ss.
Olive Oil	ʒ iij.

M. Apply on compresses every two to three hours, an ice-bag being superimposed if there is much pain.—DR. H. HAHN, *Therap. Gaz.*

Sulphate of Zinc	℥ ss.
Olive Oil	℥ viij.

Shake thoroughly and apply on soft cloths, two applications being usually sufficient.—DR. BUZZEL, *Idem.*

Osmate of Potassium, made by Merck, of Darmstadt, to take the place of osmic acid, has been reported to have proved serviceable in epilepsy. The salt is preferable to the acid as being less hygroscopic and less irritating to the respiratory organs.

GINGER IN "SOLUBLE ESSENCE."

BY LUTHER F. STEVENS, OF BROOKLYN, N. Y.

THE published accounts of the work done by Mr. Thresh, of London, in his studies upon ginger proved exceedingly attractive to the present writer, and one dull afternoon, some years ago, while running through that gentleman's experiments, the thought would obtrude itself upon the brain, that if in the second stage of his operation "lime or magnesia" was disadvantageous, perhaps it might be also in the first, although he there uses it to throw down the resins. This idea led on to the further query: Why should not water alone be a sufficient precipitant? Thence followed trials and detailed experiments which eventuated in the proof to the writer's mind that it was possible to easily produce, by a simple process, a truly soluble essence of ginger, readily miscible with any ordinary diluent, and yet representing all the grateful portions and the real therapeutic values of Tinctura zingiberis, Ph. 1870, and greater than the tincture of 1880, in the same doses, and at a less prime cost.

Mr. S. A. D. Sheppard, who has contributed much to the history of ginger, in answer to a query before the Mass. State Pharmaceutical Association, June, 1885, recites the successive attempts at a soluble essence, mentioning, successively, B. Proctor, of England, or the alum process, where the resins are partly precipitated, partly broken up by sulphate of alumina.

Creuse's, or the magnesia plan (also at first adopted by Thresh without credit to Creuse), where the concentrated alcoholic tincture is treated with magnesia, filtered, and then evaporated to increase the strength.

Carl Rube's process, or the scrap filter-paper method; getting rid of the alcohol by evaporation at a very low temperature, and then dissolving as much as possible of the remainder in aqueous medium.

Also Thresh's later process; all resins precipitated by air, hydrated lime, freeing from lime by an acid, and then clearing and fining the product.

Another method still, and one used by some manufacturers of bottlers' supplies, is simply to saponify the resins in the usual way by means of a strong alkali.

None of these are exactly satisfactory; some attempt too much, some are deficient in aroma, some, if still hot, are open also to the objection of a soapy chemical taste and smell.

So brother Sheppard concluded, and correctly, that, owing to the peculiar constituents of Ginger, no preparations from it could be made which will mix readily with aqueous menstrua and still accurately represent the drug.

To Mr. Thresh is due the great credit of the discovery of gingerol, which had been suspected by Prof. Buchheim during his experiments in 1873, but has not up to the present time, so far as I can find from any publication, been isolated.

The oils and resin had been well known since the study put upon the article by our own Proctor when he devised a fluid extract.

Thresh finds in ginger a hot pungent resin, a secondary less active resin, an active principle gingerol, a volatile oil, a heavy oil, wax, fat, gum, coloring matters, etc.

We wish to save nearly all of these except the first hot resin. Therefore, into a half-gallon bottle put the following:

℞ Fluid Ext. Ginger.....Oi.
Powd. Pumice stone..4 oz. avdp.
Water.....Oij.

Pour the fluid extract into the bottle, and add to it the pumice; shake well occasionally during several hours, and then slowly add the water in portions of about four fluidounces, with plentiful agitation, and alternate periods of rest and subsidence. Continue this at intervals during twenty-four hours, then filter, and upon the mass in the filter pour water until three pints are obtained, or until the three pints of partly alcoholic liquid originally mingled are pushed through, without allowing much water to pass. If the filtrate thus obtained is not quite clear, it may be shaken with a little more pumice or a very little clean talc; the latter, however, must be used with care, as it is a magnesium compound, and may produce a noticeable effect upon the delicate flavor we seek.

The finished product is a delightful representative of the ginger minus the hot taste. It has the full aroma, and, taken internally, is a prompt and rapid diffusible stimulant without after-reaction.

It is of light straw color (the color varying with different samples of powdered root), darkens slightly upon standing, and by deposit of a little resin becomes in time a little cloudy.

The water here does the precipitating, throwing down from the strongly alcoholic solution the dark resin and some of the coloring matters.

The inert separating material prevents the agglutination of the precipitate into flakes and lumps. The alternate agitation, rest, and subsidence enables the new dilute spirit to dissolve nearly every essential portion except the alpha resin.

Mr. Thresh, in 1882, tried the water and pumice plan, but dumped the whole together at once, and, after rapid agitation, filtered, when he found so little aroma in the product that he abandoned the plan, missing one of the necessary points of the manipulation, viz., an allowance of time for the exchange of solvents from strong to weak spirit.

Aluminates, any alkali, even the alkaline earths or their carbonates, are detrimental to flavor and aroma. Thresh proved that this was because the two principles—volatile oil and gingerol—are very readily broken up; the latter particularly being supersensitive to rough treatment. Heat drives off volatile oil, ether only may be distilled from a solution containing it; ethereal extract of ginger may be freed from the ether, which distils at 98° to 100° F. (37° C.), but shortly after that has passed the oil comes over by itself. In distilling mixtures of various alcoholic strength, the volatile oil begins to come over with the very first portion of spirit at 180° to 185° F. (78° 80° C.), and continues until the aqueous vapor rises at 211° to 213°, by which time all the volatile oil has escaped from the flask. If the heat is continued up to 220° to 225° F. (104° to 107° C.), the remaining gingerol begins to suffer decomposition; it will even commence to break up by long boiling with water.

Some preliminary points need noting here: the ginger used should be true "Jamaica," because the volatile oil from that variety is far pleasanter than when obtained from African or Chinese (Cochin ginger), and besides, both the other kinds have far more of the resins which we seek to eliminate.

The fluid extract should contain no glycerin, is preferable when freshly prepared, and should not have been heated in the process of manufacture, because there will have been loss of essential matters.

The powdered pumice, as obtained in the market, has sometimes a little starchy matter from the mill, and sometimes a portion of impalpable powder, either of which go through the filter, but can be removed by the second shaking, as before spoken of. Powdered silica may be used in place of pumice. Kaolin, fuller's earth, or talc are not advisable.

Endeavors to increase the strength of the finished preparation, that is, to make it represent more than 33% of the soluble portions of the fluid extract, are not economical, as there is loss of gingerol upon the filter; and increase of alcoholic strength causes more resin to pass through, which afterwards is slowly deposited.

That the soluble essence as thus produced contains volatile oil is proved by distillation, or, easily, by throwing a teaspoonful upon the surface of hot water in a cup, when it becomes evident to the nose. That it contains essence of ginger or gingerol is proved by physiological test—by swallowing some, when shortly a genial glow is felt extending throughout the circulation.

The mass remaining upon the filter, if dried and washed with alcohol, yields a solution of hot resin of value for cooking, or for the delectation of "old drunks." If the alcohol is recovered by distillation, it is found to be sweet, clean, and pure, fit for any purpose, which shows that no volatile oil clings to the filter, and the resin will be left behind thick, black, and hot, and about 3 fluidrachms of it form 16 Troy ounces of Jamaica ginger; the sample shown weighed 177 grains, a little over 2%. (Thresh averages about 2%.) Without doubt, there will be plenty of use found for it.

The pumice may be regained after washing, white and handsome, ready to be used again; so that this seems to be the Frenchman's ideal process where nothing is lost.

In the distillation of the alcoholic washings, if the heat be pushed at the last, after the spirit is all off, a pungent smell is noticed for a few moments in the air immediately surrounding the apparatus; but nothing condenses in a Liebig condenser supplied with cold water, showing that a trace of gingerol hangs on to the last. Thresh has found it difficult to entirely free the resin from gingerol.

Of this soluble essence, 50 C.c. was evaporated at a gentle heat in a weighed capsule until weight ceased to be lost; it gave a total residue of 21, which, doubled, equals .42, or a little less than ½ of 1%.

To prove the presence of volatile oil, 50 C.c. was distilled until all spirit had passed over, and collected in an iced receiver. It has the smell of the oil, fragrant, but slight taste.

The residue is aromatic, aqueous, cloudy, and *warm*. To find when the oil comes over most freely, 50 C.c. was distilled to dryness, the Liebig condenser iced, and the products received in succession small portions of about 5 C.c. in small iced receivers.

Distillation commenced with No. 1 at about 185° F., No. 2 at about 200° F., No. 3 at about 203° to 212° F. Each of these smelled strongly of the volatile oil, the No. 1 much the most so. With No. 3, all the spirit had come over, and with it all the aroma. Successive numbers caught only aqueous matters of little smell or taste until No. 7, at 213° F., which begins to have a peculiar smell, partly pungent of ginger and partly burnt—evidently some of the gingerol and its products in aqueous solution. This continued up to dryness in Nos. 8 and 9, at 225° F. The residue in the flask dissolves part of it in alcohol, and is pungent and hot to taste, empyreumatic to the smell. Part dissolves only in water, and is pungent to the taste, aromatic and tarry to the smell. The first contains some resins, some products of gingerol, and some gingerol. The second, considerable *crude gingerol*, some tarry matters soluble in water, but *no* resin.

From the original fluid extract there was taken 50 C.c., and distilled

in the same manner as above, and at same heats, except that about 3 fluidrachms were received at once in iced homœopathic vials. The spirit oil came over smelling of volatile oil, the first the strongest; but no taste developed until No 4, nearly the last of the spirit, and No. 5 (about 1 fluidrachm), which smells and tastes of the gingerol. No. 6 (½ fluidrachm), is aqueous, with a drop or two of apparently the terpene, or else a heavy oil. It has little taste, but a strong burnt smell. The residues were charred so much as to produce only decomposition products—creasote and coal. This cursory examination, pharmaceutical in its character, and not strictly analytical, seems to prove that this product contains all the volatile oil or aroma, all that is possible by any process of the gingerol or active principle and a small portion of the flavoring resins, and is minus the hot resin and most of the coloring.

DETERMINATION OF MELTING POINTS.*

BY HENRY C. C. MAISCH.

A PHARMACIST has many compounds of different properties to work with. A method for the determination of melting points used with one of those compounds may work well, while it can be used in few others. We must consequently use a method which best suits the subject under consideration; thus phosphorus could be melted under water, while the different camphors can be melted on mercury. From the above remarks it can easily be seen that the best manner of treating the subject of melting points would be to class those articles together whose melting point could best be determined by the same method. The headings under which I propose to consider the different methods are as follows: Class I. Camphors, Resins, Waxes, and Alkaloids; Class II. Fats; Class III. Subjects not easily oxidized; Class IV. Subjects easily oxidized in contact with air.

Class I. Camphors, Resins, Waxes, and Alkaloids.

The method which I would advise being used for this class is the following: A small beaker is filled two-thirds full of mercury, into which a thermometer is suspended so that the mercury just covers the bulb of the thermometer. A small quantity of the article under examination is placed directly on the mercury and kept as close to the thermometer as possible. Heat is then gradually applied, so that the rise of the mercury in the thermometer does not exceed two or three degrees Fahrenheit a minute. When the first indications of melting are visible, note the number of degrees and carefully regulate the heat so as to keep the temperature stationary at this point for a little time, to see if the whole quantity will melt. If the article under examination does not melt completely, again very carefully apply heat until the whole quantity is melted to a transparent liquid. The temperature at which this takes place can be regarded as the melting or fusing point near enough for all practical purposes, though, if greater accuracy is required, it is first necessary to examine a body with a known melting point, under the same conditions as are those when examing the body with the unknown melting point. We obtain thus the ratio of variation in this particular instance, and the required melting point can then easily be obtained from the given data. This comparison can be used in all subsequently named classes.

Class II. Fats.

The above method can be used here also, but it will not give such satisfactory results as the following: A small thin glass tube is drawn out very fine, and the melted fat then sucked up into the tube, the capillary portion of which is melted to a point. The part to be used is then laid aside for two or three days in a cool place. The tube is attached to a thermometer by means of a rubber band in such a manner that the capillary portion is as close to the bulb of the thermometer as possible. The apparatus is then placed so that the liquid, either water or sulphuric acid, just covers the bulb of the thermometer. Now gradually apply heat, being careful about the rise of the mercury in the thermometer. The melting point is that degree at which the column of fat is transparent. Another method is to have the capillary tube open below, and noting the temperature at which the fat is pressed upward in the tube. This latter method does not give as accurate results as the former, some fats becoming entirely soft before they are melted, but it can be used to good advantage in determining of the melting points of some resins.

Class III. Subjects not easily oxidized.

The method given under Class I. can be used here, but only in such cases where no reaction takes place. Where this method cannot be used, we must resort to the sand-bath and a thin porcelain capsule. The temperature registered by the thermometer will be several degrees too high; as a correction we can use the comparison mentioned under Class I.

Class IV. Subjects easily oxidized in contact with air.

Subjects under examination, like sulphur, phosphorus, and others which easily burn or oxidize, or in which there takes place dissociation or other chemical change when heated in air, must be melted in some liquid in which the article under examination is not at all or only very slightly soluble, and with which no chemical decomposition takes place. The best manner in which to apply this method is to suspend a piece of the substance in the liquid, and keep the bulb of the thermometer as close as possible to it. This method has been tried by Gerardin (*Compt. Rendus*, 1863, LIV., 1,083) with sulphur and phosphorus in different media, and the melting point was found to be invariably 111.5° C. and 44.3° C. respectively.

At various times, descriptions of apparatus for the determination of melting points have been published. Dragendorff ("Analyse der Pflanzen," 1213) does not apply heat directly to the beaker spoken of under Class I. He allows the rim of the beaker to rest on the top of a filter dryer, and covers the whole with a bottle, the bottom of which has been taken out. The thermometer is suspended through the neck of the bottle, and is there fastened by a cork. The whole apparatus stands on an iron plate, the filter dryer being of such a height that the beaker does not rest on the plate. Heat is now applied gradually to the iron plate, carefully regulating the temperature.

Another form of apparatus has been described by Gustav Oldberg (*Rep. d. Ana. Chem.*, 1886, 94).* The apparatus consists of two glass tubes of different diameters. A bulb is blown into one end of the narrower tube, and the tubes then connected above and below with each other by two glass tubes, the upper one being the wider, and being attached somewhat slant. The apparatus is then filled with water or some other liquid so as to almost fill the upper connecting tube. A thermometer with the subject under examination in a fine glass tube is then adjusted so that its bulb is in the bulb of the apparatus. The liquid in the apparatus is then heated gradually in the wide upright glass tube.

Authors vary very much in regard as to which point shall be taken as the melting point. F. Rudorff (*Pogg. Ana.*, 1870, 140, 420) holds that the congealing and melting points are identical, and that the temperature at which the subject congeals shall be regarded as the melting point. Other authors, opposed to the foregoing, hold that the congealing and melting points are at different temperatures.

In conclusion, I would like to make a few remarks as to the value of the melting points given in the Pharmacopœia. Melting points should not be given in the Pharmacopœia, except in such places where they are necessary for testing the purity of articles, for example, in the cases of glacial acetic acid, oil of theobroma, petrolatum, etc. The melting points of the various alkaloids and several other articles are entirely out of place in the Pharmacopœia, these only belong to the text-books.

*Read at the meeting of the A. P. A.

*Described and illustrated in this Journal, July, 1886, p. 124.

DIOSCOREA BULBIFERA.

BY J. U. AND J. G. LLOYD.

WE submit herewith, as a curiosity, to the members of the American Pharmaceutical Association a specimen of the aerial tubers from the *Dioscorea bulbifera* L. The plant is a native of Ceylon, but it is now cultivated in some parts of the Southern States. The specimen submitted herewith was obtained through the courtesy of Dr. J. F. Walker, of New Orleans.

Numerous species of *Dioscorea* are cultivated in tropical countries for the tuberous roots, which are edible, containing a large proportion of starch. The *Dioscorea sativa* is the most common one in the Southern States, as the tubers are highly relished by the negroes, who call them *yams*. We have also a native species of *Dioscorea*, the roots of which do not bear tubers, but on the contrary are very hard and woody, and are used in medicine under the name of colic root or wild yam. The interest attached to the tubers presented are that they are borne above the ground. For while a large number of plants have subterranean tubers, but very few bear them on the stem. We have a species of lily, also a few other plants that have this habit, but it is comparatively rare in the vegetable kingdom.

Lotion for Rhus Poisoning.—Dr. E. Mommsen, of Bloomington, Ill., writes to the *Medical Record* that immediate relief to the patient poisoned by *Rhus venenata* followed the local use of

Carbolic Acid	gr. x.
Boric Acid (powdered)	ʒ ij.
Vaseline	ʒ i.

M. Apply two or three times daily.

Cuticura ointment is reported to consist of a petroleum jelly, colored green, perfumed with bergamot, and containing 2% of carbolic acid.

"Trinitrine" is the name adopted in many European localties in prescribing nitro-glycerin, in order to avoid alarming nervous patients.

The Volta Prize.—The Volta prize of 50,000 francs will be awarded by the Paris Academy next year for the most worthy discovery in the province of electrotechnics in its application to chemical, technical, or therapeutic uses. The theses must be presented by June 30th, 1887.

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EDITORIAL.

DISPENSING DOCTORS.

"I HAVE read with satisfaction your editorial on 'Counter Prescribing' in the last AMERICAN DRUGGIST. Now, do you not think *something* should be said for the benefit of the patrons of the DRUGGIST on 'Physicians Dispensing their own Remedies,' which they buy of the druggist at greatly reduced prices and *give* to their patients; thus 'doing' the amiable druggist out of his legitimate profit?

"'*Ne sutor ultra crepidam.*'"*

UNQUESTIONABLY, something may be said on the subject referred to by our correspondent, and in the first place let us understand that, while the law of the State of New York confines the practice of medicine to legally qualified and licensed physicians, dispensing is not restricted, in the same way, to legally qualified and licensed pharmacists, for the law regulating the sale of medicines makes an exception in the case of physicians dispensing medicines to their own patients. In the case referred to in our last issue, it was the presumption that the law had been violated that led to the proceedings before the court. To completely reverse the situation, as our correspondent seems to have intended, we should have a suit brought by a pharmaceutical association against a physician for selling medicines to other persons than those who are his patients. Now, no publication has been made of such a practice carried to a degree that would warrant complaint on the part of pharmacists or, much less, a suit for enforcement of the pharmacy law.

Second.—Respecting the custom of physicians dispensing, themselves, the remedies they use in their practice, it may be safely presumed that three-fourths of the doctors of this country do so. Perhaps a smaller proportion of doctors in New York State follow this custom, but it is certainly the case that they are in the majority. Those who write prescriptions for nearly everything which they administer are to be found only in cities. Even in towns and villages of considerable size, where good pharmacists can be found, the custom of physicians dispensing is to a great extent in vogue; and even in cities there are to be found many physicians who do so as a rule, prescriptions being written by them only when something out of the ordinary is demanded, or when external applications are desired.

Doubtless the proportion of those who dispense as well as advise is growing less in some localities, but we suspect that the practice among manufacturing pharmacists of sending circulars and agents directly to physicians, and of preparing remedies in such forms as pills, tablets, granules, pills, troches, divided powders, capsules, fluid extracts, etc., tends very largely to encourage dispensing by doctors even in the larger cities.

The conditions of the practice of medicine and of the drug trade must undergo a very decided change before the present state of affairs in this regard will be altered. In sparsely-settled regions the doctor must always be his own dispenser, and he will purchase his medicines either from the nearest retail pharmacist, or of a wholesale house, in trade packages, and in the latter case at as low a rate as they can be obtained by the pharmacist. A short time since, during the height of the excitement over rate-cutting among retail pharmacists, some attempts were made to prevent sales to physicians by wholesale druggists, but we are not aware that these efforts were successful.

Respecting the custom referred to by our correspondent, of physicians purchasing remedies of the druggist at greatly reduced prices and *giving* them to their patients, we can hardly believe that such instances are sufficiently numerous, or the amount of medicine so given away so valuable as to seriously affect the welfare of the druggist. It is probable that greater damage to the interests of the latter would follow a practice of having a druggist fill prescriptions for which the physician pays a low price, and which he furnishes to his patient at the same low price. This, however, involves an amount of trouble without corresponding profit, not likely to be undertaken by a physician in much demand, and is only likely to occur under extraordinary circumstances — circumstances which would warrant the exercise of some degree of charity, perhaps, on the part of the pharmacist.

It is a very proper practice among many pharmacists, when called upon by a physician to prepare a prescription for which the physician has to pay, to inquire whether it is for his *personal* use or for a patient. In the former case, the amount charged will depend very largely upon their personal relations, whereas when the medicine is for a patient, and is to be paid for, the full price is charged. It certainly indicates a remarkable disregard, on the part of a pharmacist, of his own interests and the interests of his calling if he is willing to habitually sell drugs to any person who is not in needy circumstances for what they cost, and take no account of the value of professional services rendered in compounding them. Even when medicines are supplied in bulk to physicians who dispense them, the pharmacist who does so should derive *some* profit from the transaction.

What the doctor chooses to do with his remedies after he has bought them becomes, then, his own affair. If he sells them for what he can get, his practice resembles that of every other dealer. If he prefers to give them away—that is also his business.

ALLIED to this subject is that of paying a percentage to doctors on the prescriptions ordered by them; and upon this there can be but one honest opinion. The doctor who exacts such a percentage and the apothecary who pays it, both deserve to be driven from any community. Neither should receive the patronage or society of decent people.

John Wyeth & Bro., of Philadelphia, have secured the conviction in a Brooklyn court, of James Crosher, who in company with others have for some time past been selling fraudulent imitations of the wares manufactured by that house. Crosher was fined $200, or imprisonment for 200 days if the fine is not paid.

DR. CLEMENTE FORETTI, late Prof. of Chemistry and Pharmacology at the University of La Paz (Bolivia), claims to have proof that in 1857 Prof. Enrique Pizzi, of La Paz, isolated the alkaloid of coca leaf—two years before it was discovered by Niemann, the German chemist. Foretti has not only documentary evidence, but also specimens of the cocaine made by Pizzi in 1857.

DR. BROADBENT, of London, in a recent address before the British Medical Association, called attention to the injurious effects which follow the prolonged use of colchicum by gouty persons, and the consequent increased arterial tension which it induces. He pointed out the necessity for clearing the system after the colchicum has been used for a time, by the administration of alkalies.

DR. G. BELL, of Indianapolis, commends papayotin as a solvent for diphtheritic membrane. He blows it into the larynx by means of a glass tube of suitable size, to which a piece of small rubber tubing serves as mouthpiece.

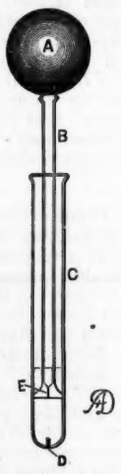
BENZOATE of sodium to the amount of 300 grains daily is recommended as a remedy for erysipelas. The temperature generally falls to the normal within forty-eight hours, and the desquamation is unusually rapid.

* The shoemaker should not go beyond his last.

WOLPERT'S AIR-TESTER.

S. W. Abbott, M.D., secretary of the Massachussetts State Board of Health, describes in the *Boston Med. and Surg. Jour.* a method introduced by Wolpert* for ascertaining the quality of the air of inhabited apartments. The instrument consists of a simple rubber bulb (A), of a capacity of 28 C.c., a glass outlet tube (B), with a constricted extremity (E). A glass test-tube (C), 12 centimetres in length and 2 centimetres in diameter, has a horizontal mark near the bottom, indicating the point to which it must be filled with perfectly clear lime-water to contain 3 C.c. The bottom of the tube is whitened, and has a black mark (D) stamped upon it. A small wooden stand, a brush or swab, a vial of vinegar for cleaning the tube, and a bottle of clear lime-water complete the outfit.

In order to use the instrument, the lime-water (a saturated solution) should be poured in the tube to the mark. Press the bulb with the thumb to expel the air as quickly as possible, and allow it to fill with the air of the apartment, insert the small tube into the lime-water nearly to the bottom, and again expel the air with moderate rapidity, so that the bubbles may rise nearly to the top of the tube, but do



Wolpert's air-tester.

not overflow, taking care to continue the pressure of the thumb till the small tube is removed from the lime-water. Repeat this process until the mark upon the bottom of the test-tube is obscured by the opacity produced by the reaction of the carbonic acid upon the lime-water, the observer looking downwards through the lime-water from the top of the test-tube.

With very foul air, it is necessary to examine the mark after filling and discharging the bulb a few times only; with good air, it must be filled twenty-five times and upwards.

The bulb represented in the cut is made a little larger than the required capacity, since a small amount of residual air usually remains in the bulb and cannot be expelled without great care.

After each observation, the test-tube must be washed out and wiped dry. If a white incrustation forms upon the tube, it may be easily removed with a little vinegar, after which the tube should be thoroughly washed with pure water and dried.

If the mark becomes obscured after filling the bulb ten or fifteen times only, the air of an apartment is unfit for continuous respiration.

In a sick-chamber, the air should be so pure that the turbidity of the lime-water will not render the mark invisible until thirty or forty fillings are made.

The instrument should be used by daylight, over a white ground, as a sheet of writing-paper, and care should be taken not to vitiate the result by the observer's own breath.

The following approximate table is taken from the article by Professor Wolpert, the first column representing the number of fillings of the bulb, and the second column the parts per 10,000 of carbonic acid in a given sample of air.

Number of Fillings.	Carbonic Acid per 10,000.	Number of Fillings.	Carbonic Acid per 10,000.	Number of Fillings.	Carbonic Acid per 10,000.
1	200.	21	9.5	41	4.9
2	100.	22	9.1	42	4.8
3	67.	23	8.7	43	4·6
4	50.	24	8.3	44	4.5
5	40.	25	8.	45	4.4
6	33.	26	7.7	46	4.3
7	29.	27	7.4	47	4.2
8	25.	28	7.1	48	4.1
9	22.	29	6.9	49	4.1
10	20.	30	6.6	50	4.
11	18.	31	6.4	51	3.9
12	16.	32	6.3	52	3.9
13	15.	33	6.1	53	3.8
14	14.	34	5.9	54	3.7
15	13.	35	5.7	55	3.7
16	12.5	36	5.5	56	3.6
17	12.	37	5.4	57	3.5
18	11.	38	5.3	58	3.5
19	10.5	39	5.1	59	3.4
20	10.	40	5.	60	3.3

* Einfache Prüfung der Luftreinheit in Wohnräumen, von Dr. Wolpert, Prof. in Kaiserslautern. Centralblatt für Allgemeine Gesundheitspflege, Vol. II., p. 231.

Sending Liquids by Mail.—The following is an abstract of Order No. 135, by the Post-Master General: Liquids and oils (not to exceed four fluid-ounces), pastes, salves, or articles easily liquefiable, must be inclosed in a wooden or *papier maché* block, not less than three-sixteenths of an inch thick in the thinnest part, strong enough to support the weight of mails piled in bags and resist rough handling. Between the bottle and the block must be some absorbent, such as cotton, felt, asbestos, cork crumbs, in order to prevent damage to other parcels. The top of the block must have a metal or wooden screw lid fitting tightly and have rubber pads. Articles not liquid must be placed in a bag, box, or removable envelope or wrapping made of paper, cloth, or parchment, and placed within a box or tube of metal or wood with sliding clasp or screw lid. If the articles are liable to break, there must be some elastic packing between the inner package and the box or tube in which it is mailed. Ethereal or inflammable articles are excluded.

Oil of Turpentine is highly recommended by Dr. L. Eliot, of Washington, D. C., as a remedy for aborting mammary abscess. Immediately upon the discovery of a tender, hard spot in the gland, it is to be bathed with oil of turpentine, and a piece of rag or flannel saturated with it is to be applied. The child should be allowed to nurse less often from the affected breast, and, as a rule, the trouble will disappear in two or, at most, three days.—*Med. Record.*

Anodyne for Irritable Bladders.—W. P. Copeland, of Eufaula, Ala., says that the irritable bladder commonly met with in old men who have an enlarged prostate may be relieved by injecting, through a soft catheter:

Benzoate of Sodium..gr. x.
Tinct. Gelsemium...gtt. xx. ad gtt. xxx.
Water.....℥ i.

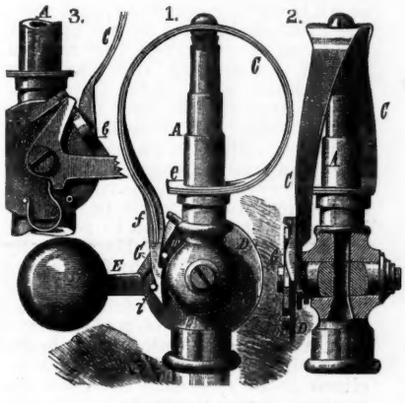
Warm before injecting, withdraw the catheter, and allow it to remain in the bladder twenty to thirty minutes. The catheter may be reintroduced to facilitate the escape of the remedy.—*Med. Record.*

AUTOMATIC SHUT-OFF FOR GAS BURNERS.

On page 83 of our last May number we gave an illustration and description of an automatic cut-off for gas burners, which is intended to prevent accidents in laboratories.

The principle involved in the construction of this apparatus—which is itself an improvement of another previously illustrated by us on page 67 of our volume for 1884—is very similar to that which underlies the automatic shut-off for ordinary gas burners lately patented by W. W. Sherman, of 316 Fourth street, San Francisco (*Scient. Amer.*, June 12th), and which is here illustrated.

The compensating spring C is composed of an outer brass spring and an inner steel spring united, and is bent to pass up over or in proximity to the top of the burner, and its free end is formed with a catch, *f*, having notches upon opposite edges, one above the other, that engage, but not simultaneously, with the pins *i*, *m* on the plate D, secured to one end of the cock. The pins are at a slightly greater distance apart than the notches. Pivoted to the cock is a weighted lever E, which is held against the outside of the plate by a spring O, a bent arm of the lever resting against a fixed stop or upper end of a cam-shaped lever G, arranged



Automatic shut-off.

to come in contact with the free end of the spring. When the cock is closed, the lever E occupies a vertical position with its weighted end down. Upon raising this lever to a horizontal position—the plate D turning with it—the pin *i* is caused to engage with the lower notch, while the pin *m* will be out of engagement with its notch. The escaping gas may now be lighted. The heated spring contracts, owing to the different rates of expansion of the two metals composing it, when the outer notch will free itself from the pin *i*, and the inner notch will engage with the pin *m*, thereby preventing the cock from closing. Should the gas be extinguished by accident, the spring, upon cooling, will expand, free the notch from the pin *m*, and allow the lever to drop and shut off the gas by turning the plate attached to the cock. To extinguish the flame by hand, the lever E is simply depressed, when its bent arm presses the pivoted cam-piece G against the spring C to force the catch from engagement with the pins, and permit the lever to close the cock.

Narceine has been found by French physicians to be an excellent remedy in whooping cough—surprisingly quick results having followed its use. The best mode of administering it is in a syrup of which a teaspoonful represents one centigramme of the drug. This is the minimum dose for a child, the average being two and one-half to five centigrammes.—*Med. Rec.*

The Sceptic.

A CORRESPONDENT writes:—The great opponent to all progress in therapeutics is the sceptic. He never loses an opportunity of stating that he does not believe in therapeutics, "if there be such a thing." He publishes a book on medicine, and ostentatiously leaves out all reference to treatment. He declares openly that he does not know of any disease or morbid condition which can be influenced in the slightest degree by drugs. He does not credit any statements as to the good effect of iron in anæmia, and scoffs at the idea of mercury being of the slightest practical value in the treatment of syphilis. He has a deeply rooted antipathy to phosphorus and arsenic, and considers any one who prescribes them either a knave or a fool. In lecturing on the uses of such a drug as digitalis, he tells his audience that the dose of the infusion is from a teaspoonful to a bucketful; "it is all the same." When called upon to treat a case of poisoning, he advocates "expectant treatment," and is decidedly adverse to antidotes on principle. The sceptic is not, as a rule, well read; he is apt to think that every drug with which he is not familiar—and they are many—must needs be "an American quack remedy." The term "pharmacology" is not familiar to him, but he thinks it "has something to do with dispensing." By a curious coincidence, he is to be found on all hospital committees, and takes the greatest interest in the appointment of the lecturers on materia medica, preferring the candidate who knows least about it, on the ground that he will have no preconceived ideas. The sceptic probably commenced life as a pathologist, but, after a variable period of time, has lost faith even in that. Having thrown his medical studies aside, he devotes his energy and attention to recondite works on philosophy. He gradually develops a disbelief in any future, and is doubtful about the past. At his necropsy, in which he possibly regrets being incapacitated from taking a part, a gumma is found in his brain, for which, years before, he had declined to be treated. Such are the men and the minds who so persistently oppose all progress in therapeutics. Unfortunately, their influence, pending the fatal termination, is often extremely prejudicial to any advance, and acts as a damper to the more enterprising and restless spirits, who, imbued with the enthusiasm of their calling, seek to obviate the present imperfections in our means of diagnosis and treatment, and have the courage of their opinions. The most disastrous effect is thus produced on the minds of students, who are only too glad of an excuse to avoid the arid and difficult manipulations and study necessary to an intelligent comprehension of the facts at issue.—*British Medical Journal.*

Dangerous Lemonade.—A style of lemon-squeezer has been recently sold quite extensively which is made of galvanized iron, or iron covered with a coating of zinc. A word of caution should be given against the use of such articles, as the citric acid of the lemon will readily dissolve the zinc, forming unwholesome and poisonous salts. Lemon-squeezers should be made either of plain iron or wood, or, better, like some we have observed, where the surfaces brought into contact with the fruit are of glass or porcelain. Zinc is a metal which is readily attacked by the weakest acids, and no article of food or drink should ever be allowed to come in contact with it.

ALCOHOL is said to render croton oil less irritating but none the less effective.

The Strength of Spirit of Nitrous Ether.

A QUESTION of some importance to the medical profession came the other day before the Thames Police Court, when Mr. John Read Morrison, a practitioner, of 57 Cannon street, St. George's-in-the-East, who keeps a shop, was summoned for selling a quantity of spirit of nitrous ether not of the nature and quality of the article demanded, the drug being deficient in nitrous ether to the extent of eighty per cent. Mr. William Raines, sanitary inspector to the parish of St. George's-in-the-East, said that on June 10th, about 11 o'clock, he called at the shop and asked for two ounces of spirit of nitrous ether, which the defendant served him with, and for which he paid 8*d*. Witness then told him that it would be analyzed by the public analyst. The analyst's certificate showed that the drug was deficient in nitrous ether to the extent of eighty per cent. Mr. Young, who defended, submitted that there had been no offence. The article was pure, and the deficiency was caused by decomposition and evaporation. Mr. John Beckett, assistant to Dr. Tidy, at the London Hospital, said he had analyzed the sample of the drug submitted to him by the defendant, and found it to be pure. The nitrous ether was liable to decomposition and evaporation. There was certainly a deficiency. Every time the bottle was opened, some of the nitrous ether would go out. Mr. Hannay said it was too important a question for him to decide at once, and he adjourned the case for a week.

Cinchonidine in Quinine.—Recently the well-known quinologist, M. de Vrij, has brought to prominent notice the fact that large quantities of cinchonidine salts were present in some brands of foreign quinine, and his assertions, as contained in a communication made to the Pharmaceutical Society of Paris, caused it to take special action in the matter. A committee was appointed to investigate the facts, and recently the chairman, M. Jungfleisch, presented his report, which fully substantiates the claims of M. de Vrij.

The statement of M. Jungfleisch is that he found market samples which contained 8, 10, 12, and 16 per cent of cinchonidine. Quinine containing this salt was much more bulky—in fact, it is asserted that all the *light* bulky quinine of commerce is of this characteristic, viz., containing cinchonidine. He, therefore, advises that *all light* quinine *should be rejected*, and contends that *no pure* quinine sulphate can be made having the character of unusually light bulk. Of the intimate connection of these two alkaloids, it may be said that their pre-existence together in some barks makes it a difficult matter to separate them at times, and some samples of cinchonidine contained as much as 10 per cent of quinine.

To Distinguish Oleomargarine from Butter.—J. Horstler recommends the following procedure: A piece of oleomargarine the size of a hazelnut is placed in a test-tube, and the end made air-tight. Into another test-tube a like quantity of butter is treated in the same way. When both test-tubes are held in the hand, the oleomargarine soon liquefies, forming a clear solution; whilst butter requires double the time for solution, and when dissolved is not so clear as the oleomargarine solution. When the tube is filled one-third full with ether, the oleomargarine is easily dissolved, and does not produce any turbidity or precipitate on the addition of alcohol. Butter when treated in like manner yields a precipitate.

How to Cool a Cellar.

A GREAT mistake is sometimes made in ventilating cellars and milk houses. The object of ventilation is to keep the cellars cool and dry, but this object often fails of being accomplished by a common mistake, and instead the cellar is made both warm and damp. A cool place should never be ventilated, unless the air admitted is cooler than the air within, or is at least as cool as that, or a very little warmer. The warmer the air, the more moisture it holds in suspension. Necessarily, the cooler the air, the more this moisture is condensed and precipitated. When a cool cellar is aired on a warm day, the entering air being in motion appears cool, but as it fills the cellar the cooler air with which it becomes mixed chills it, the moisture is condensed, and dew is deposited on the cold walls, and may often be seen running down them in streams. Then the cellar is damp, and soon becomes mouldy. To avoid this, the windows should only be opened at night, and late—the last thing before retiring. There is no need to fear that the night air is unhealthful—it is as pure as the air of midday, and is really drier. The cool air enters the apartment during the night, and circulates through it. The windows should be closed before sunrise in the morning, and kept closed and shaded through the day. If the air of the cellar is damp, it may be thoroughly dried by placing in it a peck of fresh lime in an open box. A peck of lime will absorb about seven pounds or more than three quarts of water, and in this way a cellar or milk room may soon be dried, even in the hottest weather.

A Useful Plant.—Dr. Brandes, a Hanoverian physician, has recently demonstrated in a German contemporary the valuable properties of the *Anacharis Alsinastrum* Babingt. (*Elodea canadensis* Rich; *Anacharis canadensis* Planchon), a water-plant which has hitherto been considered as an unmitigated nuisance, choking up rivers, and entirely useless. Dr. Brandes has remarked that in the district where he lives, and where malaria and diarrhœa yearly appeared in a sporadic or epidemic form, those diseases have gradually decreased since the *Anacharis Alsinastrum* began to infest the neighboring rivers and marshes, and for four years have totally disappeared. He therefore proposes that the plant, which came originally from Canada, should be planted in marshy districts, with the view of checking malaria; and the experiment, in view of the evidence adduced in the article under notice, is certainly deserving of consideration.

Calabar Bean in Epilepsy.—Dr. Ruche (*Med. Zeit.*) recommends the trial of Calabar bean in epilepsy when the bromides and atropine have failed. Very curiously it has been found most efficacious when the dose is alternately increased and diminished. He uses the following formula: Extract of calabar bean, 7½ grains; spirit of ether, 75 minims; peppermint water, 5 drachms. Dose: 5 to 10 drops for children, 8 to 15 drops for adults, three times a day. The smaller dose is commenced with the first day, and one drop added each day until the maximum is obtained, and then the quantity is diminished by a drop each day until the minimum is reached.

The Liebig Monument Fund amounts to $25,000, and the monument will be erected at Giessen, where Liebig first won fame as a lecturer on chemistry.

QUALITY OF THE BELLADONNA LEAVES OF OUR MARKET.*

BY A. B. LYONS, M.D.

A REPORT was made on the subject of this query to the Ohio State Pharmaceutical Association, which had not met at the time I accepted the query. I gladly avail myself of the material supplied by this paper, which is by Prof. Coblentz, a member of our Association, in addition to that which I myself have gathered.

Several processes for the assay of belladonna leaves have been published within a few years. The methods formerly adopted were more or less tedious, and required for their satisfactory execution a considerable amount of material.

The plan which I have for several years practised with satisfaction commends itself by its simplicity and rapidity. The drug is perhaps incompletely exhausted, particularly when it is rich in alkaloid, but comparative experiments have shown that for practical purposes the results are fairly trustworthy.

The belladonna leaves are reduced to about a No. 30 powder; I do not think it worth while to try to make a fine powder. Ten grains of the powder, accurately weighed, are introduced into a bottle or flask, and 100 C.c. of a mixture of ether 65 volumes, alcohol 5 volumes, and stronger ammonia 1 volume, is poured in, and the flask or bottle is at once securely corked. The mixture is shaken at intervals during 24 hours. At the end of that time, 50 C.c. of the clear supernatant fluid is measured out, transferred to a two-ounce prescription vial, and shaken with 5 C.c. of water containing about 10 drops of dilute sulphuric acid. Care is taken that the acid is in excess. When the aqueous fluid has separated, the ether is transferred to another similar vial, containing 5 C.c. of acidulated water with which it is shaken a second time to remove the last traces of alkaloid. When it has separated a second time, the ether is decanted into a receptacle for waste ether. By this mode of manipulation, the danger of loss of alkaloid by accident in decanting is avoided, and it is not necessary to wait for the subsidence of the minute particles of aqueous liquid, which do not separate at once.

The contents of the first vial are washed with two or three successive portions (10, 10, and 5 C.c.) of ether, which is subsequently used also to wash the contents of the second vial, and is then transferred to the waste ether bottle. When the washing is judged to be sufficient, ammonia is added to the contents of both vials in slight excess, and the alkaloid is taken up by shaking with a mixture of chloroform 1 volume, and ether 3 volumes, three successive portions of 15 C.c. being generally sufficient. The ether-chloroform is shaken first with the stronger fluid in vial No. 1, and then with the weaker, after which it is transferred to a capsule, and evaporated to dryness at a water-bath heat. The aqueous fluid is tested after the third washing, to make sure that it is free from alkaloid. This is done by placing a drop of the fluid upon the surface of a mirror, rendering it acid, and adding a drop of Mayer's reagent. If this produces more than a very faint cloud, the alkaline solution is to be made acid, then again rendered alkaline, and at once shaken with a fresh portion of the chloroform-ether.

When completely dry, weigh the alkaloid, and further demonstrate its purity by dissolving it in a little dilute sulphuric acid. If it is not wholly soluble, separate the insoluble portion by taking up with ether, evaporate the ethereal solution, weigh the residue, and deduct from the weight of the crude alkaloid. However, if the operation has been carefully conducted, there will be scarcely a weighable amount of impurity.

A further check upon the weighing may be secured by titrating the acid solution of the alkaloid with Mayer's reagent, or, better, by precipitating with a slight excess of Mayer's reagent, and drying and weighing the precipitate, as recommended by Dragendorff.* This crude alkaloid may be purified by the method described by Dunstan and Ransom, but in practice the weight of the crude alkaloid obtained by the process described may be accepted as a sufficiently accurate measure of the value of the drug.

The alkaloid obtained by this assay process consists of a mixture of atropine and hyoscyamine. That these two alkaloids differ somewhat quantitatively, if not qualitatively, in their physiological and therapeutic action is probable, and hence we cannot expect that the results of an assay will enable us to fix to a nicety the dosage of the drug. Dr. Squibb has shown that, as a matter of fact, the mydriatic activity of different specimens of crude alkaloid obtained from belladonna leaf and belladonna root respectively do not exactly coincide. The variations in activity of the drug dependent upon such differences, however, are insignificant in comparison with the differences due to deficiency or excess of alkaloidal constituents.

The proportion of alkaloid present in *belladonna leaf* and *root* of good quality has been variously stated by different authorities. The following are a few of the results that have been reached by different investigators:

	Root.	Leaves.
Lefort, 1872	young, 0.60	0.44
Dragendorff, 1874	old, 0.25	....
" 1874	0.40	0.66
Buddel, 1882.	amylaceous 0.40 to 1.0	....
" 1882.	non-amylaceous, 0.14 to 0.63	....
Gerrard, 1880–85.	0.21 to 0.45	0.22 to 0.58
Dustan and Ransom, 1883–'85	0.35 to 0.39	0.15 to 0.22
Dr. Squibb, 1885.	0.42 to 0.50	0.26 to 0.34

A. M. Gerrard, in his report to the British Conference, has given results of numerous assays, arriving at the conclusion that the proportion of alkaloid in the leaf is greater than that in the root of the plant. The following are some of his figures:

Proportions of alkaloid found in belladonna leaf and root by A. M. Gerrard.

	Root.	Leaf.
Wild plant on chalky soil	.21	.23
" " " leaf mould	.09	.22
" " 27 years old	.26	.43
" " 3 " "	.38	.41
" " 4 " "	.41	.51
Cultivated, 2 " "	.21	.32
" 3 " "	.37	.46
" 4 " "	.31	.49
" in May	21	.25
" " June	.32	.36
" " July	.32	.34

It is commonly believed that belladonna root is more active than the leaf, and, while the results above given must be accepted as true for *freshly* gathered specimens of the drug, it is probable that the popular belief has a good foundation, at least as regards the drug as it is met with in commerce. My own assays, given later, confirm those of Dr. Squibb in giving precedence decidedly to the root.

It has come in my way during the last few years to make numerous assays of belladonna leaves, and not such as are offered in the New York market as of the first quality. The result of some of these assays will be given in connection with those that have been undertaken with more especial reference to the purpose of the present query. To ascertain whether the quality of the drug ordinarily sold in the drug stores is of fairly good quality, I procured from a wholesale dealer in this city a sample from his stock of leaves, and another of the pressed herb, of which he carried only one brand. From various retail drug stores I procured samples of the drug as ordinarily sold, without intimating the use I meant to make of it. The drug was kept by all the retailers, but only in pressed packages, and all the packages procured bore the name of the firm which sent them out, and no two were from the same firm.

I procured also from New York eight samples from importing houses and larger dealers. The results of assays of these various samples proved more favorable than I had been prepared to expect, particularly in the case of some of the pressed packages which were evidently several years old (Nos. 1 and 2 C. in the tabulated results below).

The market value of belladonna leaves is fixed at present purely by external characters. In the tabulated results I have given the comparative prices, in contrast with the figures showing true value. It is evident that large purchasers can afford to buy this drug by assay, unless the quality of the drug they handle is a matter of indifference to them.

The results reached in the assay of these samples were as follows (drug in the air-dried condition):

A. Samples from large dealers in New York:

No.	Per cent alkaloid.	Comparative price.
1	0.44	100
2	0.37	115
3	0.38	116
4	0.37	110
5	0.61	110
6	0.39	120
7	0.70	115
8	0.59	160

B. Leaves loose purchased in Detroit:

No. 1 Per cent alkaloid 0.40
" 2 " " " 0.29

C. Leaves in pressed packages:

No. 1 Per cent alkaloid 0.63
" 2 " " " 0.59
" 3 " " " 0.41
" 4 " " " 0.29

From the notes of assays that I have had occasion, within the past three months, to make of leaves offered in the New York market as of prime quality, I take the following data (drug in air-dried condition):

Belladonna leaf:

No.	Per cent moisture.	Extract yielded to 66 per cent alcohol.	Per cent alkaloid.
1	9.55	20.5	0.42
2	8.15	19.0	0.41
3	9.52	30.7	0.42
4	7.93	35.5	0.41
5	10.24	23.	0.40
6	9.73	21.	0.68
7	8.92	2.38	0.51
8	9.31	24.3	0.50
9	9.45	25.3	0.55
10	8.77	21.0	0.49
11	11.42	16.2	0.42
12	9.35	19.5	0.48
Averages	9.36	22.5	0.474

The highest percentage observed by us was 0.87; the lowest 0.23; average, about 0.44.

Belladonna root:

No.	Per cent moisture.	Yields extractive to 66 per cent alcohol.	Per cent alkaloid.
1	9.2	30.2	0.86
2	8.4	24.7	0.42
3	6.7	25.4	0.62
4	8.8	26.3	0.77
5	5.7	31.3	0.64
6		26.6	0.73

* Read before the Amer. Pharm. Assoc.

* "Werthbestimmung einiger starkwirkenden Drogen," 1874, 24.

7	25.2	0.55
8	23.5	0.52
9	31.0	0.60
10	24.8	0.62
11	21.3	0.51
12	24.9	0.59
Averages 7.76	26.27	0.618

The following are the results of the assays made by Prof. Coblentz.* The samples examined were stated to include dry and pressed packages, as well as the loose German and Allen's English. Several of the American pressed packages were musty and contained a large proportion of stems. The quantity of alkaloid is stated to be that obtained from 100 grammes of dry drug. Either the decimal point has been misplaced, or this is a misprint for 10 grammes.

No.	Crude alkaloid.	Purified alkaloid.
1	.0179	.0171
2	.0095	.0090
3	.0205	.0182
4	.0439	.0433
5	.0405	.0398
6	.0050	.0020
7	.0117	.0109
8	.0092	.0090

No.	German leaves.	Purified alkaloid.
1	.0221	.0212
2	.0432	.0420
3	.0185	.0180
4	.0137	.0109

No.	English leaves.	Purified alkaloid.
1	.0426	.0422
2	.0417	.0411

SUMMARY OF CONCLUSIONS.

From the data furnished by these various assays we may conclude:

1. That belladonna is a drug subject to great variations in strength, so that of two samples rated as of equal commercial value, one may be of double the strength of the other.

2. That the proportion of alkaloid contained in good belladonna is higher than has been generally stated.

3. That belladonna leaves that have been kept in pressed packages for several years do not show evidence of loss of alkaloid. It is of interest, in this connection, to note that the best sample of pressed leaves examined was a very unpromising one, put up by the Shakers, and evidently quite old.

4. That while there is undoubtedly much belladonna of very inferior quality in the market, that which is offered as prime is generally fairly good.

5. That belladonna root, as met with in our market, is richer in alkaloid than belladonna leaf, and that the extract prepared from the root should also contain a larger proportion of alkaloid than that made from the leaf with the same menstruum.

Finally, I wish to urge the importance of fixing for such active drugs as belladonna, authoritative standards of strength, and of requiring that the official preparations of such drugs be brought, by official requirement, to a definite alkaloidal standard.

Inutility of Lime Salts.—The *Medical Record*, quoting the opinions of E. Logeais, Lehman, Heiden, Veiske, Dujardin-Beaumetz, Distage, Nothnagel, and Rossbach, says, "the practical conclusion that lime salts of all kinds are therapeutically useless, is one which deserves the attention of the many physicians who are constantly prescribing them in various conditions.

Toothache from decayed teeth is said by a Swiss authority to be relieved promptly by cotton-wool moistened with a mixture of equal parts of camphor and chloral and a fifth as much cocaine.

* AMERICAN DRUGGIST, July, 1886, p. 127.

BUTTER AND ITS SUBSTITUTES.*

BY EMIL SCHEFFER.

FOR the last six months the attention of the public in general has been directed to butter and its substitutes, particularly by the agitation and acts of our last Congress. Every newspaper was full of oleomargarin, and therefore I hope you will not think harm of me when I bring oleomargarin into your meeting.

The writer of this essay does not intend to speak of the merits and demerits of artificial butters, but wishes to lay before you a method by which genuine butter can be easily distinguished and quickly examined.

The ingredients used in the manufacture of artificial butters are chiefly beef suet, lard, and marrow-fat oil. They are used in suitable proportions to obtain the consistence and melting point of genuine butter, and are churned together with fresh milk. Butter contains only a very small quantity of stearin, while the several other semi-solid and solid fats contain a larger amount, so that a greater abundance of stearin in butter is an indication that tallow or lard has been mixed with the butter either as such or in the form of oleomargarin or butterine.

The object was to find a suitable solvent by which not only the artificial butters can be easily distinguished, but which may serve also to ascertain if genuine butter was mixed with one or the other of these substances.

A liquid which shows a great difference in its solvent action on stearin on one side, and palmitin and olein on the other, might therefore answer the purpose.

After having tried different mixtures, I experimented at last with mixtures of rectified fusel-oil and stronger ether in different proportions, and at last accepted a liquid consisting of forty volumes of rectified fusel-oil and sixty volumes of Squibb's stronger ether.

Having procured genuine butter from different parties in the country, it was first ascertained how much of this solvent was needed and at what temperature a certain quantity of pure butterfat would be dissolved to a clear liquid. Butterfat was obtained by melting butter in the water-bath and decanting and filtering the liquid fat through filter paper in a glass funnel surrounded with hot water. The beaker with the filtered fat was placed in cold water and the fat stirred constantly until perfectly congealed to a homogenous mass. All the other fats experimented with were manipulated in the same way.

Of the above solvent 1 gramme of pure butterfat required 3 C.c. at 79° to 82° F. to be fully dissolved to a clear liquid, that is, of five samples

Of butterfat, 1 dissolved in 3 C.c. at 79° F.
2 " 3 " 80° "
2 " 3 " 82° "

By its taste and general appearance, the butter, whose fat required the temperature of 82° F. to be fully dissolved, was considered the best, and therefore 82° F. was taken as standard for all the following experiments.

Before going further, the solubility of beef suet, leaf-lard, and cotton-seed oil was tested, and also pure stearin which I had prepared from tallow (melting point 144° F.). The experiments were executed in the way described further on; the temperature, after having reached 82° F., was kept constantly at this point.

* Read before the American Pharm. Association.

0.2 beef-suet required, 10 C.c. or 1 Gm. required 50 C.c.
0.5 leaf-lard required 8.2 C.c. or 1 Gm. required 16.04 C.c.
2 C.c. cotton-seed oil required 3.5 C.c.
0.02 stearin required 11 C.c. or 1 Gm. required 550 C.c.

To find out if the presence of a more soluble fat would increase the solubility of stearin, 0.02 stearin and 1 C.c. of cotton-seed oil were melted together. After 3 C.c. of solvent were added and the test-tube with contents were immersed in water of 82° F., after a short time it was shaken and a clear liquid was obtained. Another 0.02 stearin dissolved in 1 C.c. of cotton-seed oil was, after addition of 3 C.c. of solvent, immersed in water of 65° F., and then set in a water-bath in which the temperature was gradually brought to 82° F. In this instance the stearin was not dissolved, and more solvent had to be added. It required pretty near the same amount as when stearin was tested by itself. It seems, therefore, that at a higher temperature (at 82° F.) the mixture of stearin and oil dissolves as a whole, while at a lower temperature the solvent acts separately, first on the oil and then on the stearin. 0.02 stearin, melted together with 0.98 butter, dissolve in 3 C.c. of solvent when immersed in water of 82° F., while, when first exposed to a lower temperature, then gradually heated to 82° F. it required 7 C.c. In this instance the stearin did not require as much solvent as in the experiment with cotton-seed oil; the margarin in the butter, no doubt, increased the solubility of the stearin.

On the deportment of stearin that, when mixed with other neutral fats, it requires more solvent than when gradually heated from a lower temperature up to 82° F., rather than when exposed to the temperature right away—my method of examination is best.

The experiments were made in well-corked small test-tubes, containing 1 Gm. of the fat or 0.5 Gm. according to quantity of fat, and 3 C.c. of solvent. They are immersed in a tumbler of water of about 65°, and the tumbler is placed in a double water-bath, heated with a very small flame, so that the temperature rises but very slowly. A thermometer is also placed in the tumbler. While the temperature increases, the test-tubes are shaken frequently, and when 82° F. is reached, care is taken that this temperature is kept constant. If not clear at this temperature, more of the solvent is added from a burette to the contents in the test-tube—according to the turbity of the mixture 2 C.c. or 1, or 0.5, or even less at a time—until ultimately all is dissolved. The test is finished when the liquid has become quite clear, and by gentle shaking of the test-tubes no silky clouds of fine stearin crystals are seen floating upon it.

The following tests were made. The samples were obtained from regular dealers in our city, except the three last ones, which were kindly sent to us from a manufacturing firm in Chicago.

Gm.	of	at F.	Required of solvent.	Or, one gramme required.
1.0	Country Butter..	82°	3. C.c.	3. C.c.
1.0	Creamery Butter.	82°	3. "	3. "
0.5	Oleomargarin....	82°	5.6 "	11.2 "
0.5	Butterine No. 1..	82°	5.5 "	11.0 "
0.5	Butterine No. 2..	82°	4. "	8. "
1.0	Oleomargarin....	82°	8.6 "	8.6 "
0.5	Neutral Lard....	82°	6.75 "	13.5 "
1.0	Oleo-oil.....	75°	3. "	3. "
2.0	Oleo-oil.....	82°	4.6 "	2.3 "

The numbers speak for themselves

from the difference in solubity between oleo-oil and oleomargarin. We may infer that the oleomagarin consists, for the greater part, of lard.

We may assume when 1 Gm. butter-fat is dissolved at 82° F. in 3 C.c. of the solvent, that the liquid is at this temperature saturated, if not with margarin, at least with stearin. The requirement of more solvent indicates a larger amount of stearin, or of stearin and magarin, and thus the presence of tallow or lard. The more solvent is needed to accomplish perfect solution the more of the admixtures are present.

It was now expedient to ascertain if this method could and might be used for the quantitative examination of spurious butter. For this purpose, butter and leaf-lard, in different proportions, were melted together, and after cooling, tested.

1 Gm. Butter	required at	82°	F.,	3	C.c.
0.05 Leaf-lard 0.95 Butter	"	"	"	3.5	"
0.1 Lard 0.9 Butter	"	"	"	3.9	"
0.2 Lard 0.8 Butter	"	"	"	4.8	"
0.3 Lard 0.7 Butter	"	"	"	5.7	"
0.4 Lard 0.6 Butter	"	"	"	6.5	"
0.5 Lard 0.5 Butter	"	"	"	7.8	"
0.6 Lard 0.4 Butter	"	"	"	9.6	"
0.7 Lard 0.3 Butter	"	"	"	11.4	"
0.8 Lard 0.2 Butter	"	"	"	13.0	"
0 9.Lard 0.1 Butter	"	"	"	14.4	"

The quantity of solvent needed in these experiments is not proportionate to the respective quantity of lard and butter, but nevertheless there is a certain regularity in it. So from 5 to 40 per cent of lard in the butter, the quantity of solvent needed above 3 C.c. goes in almost a regular progression, and is such that, for each 10 per cent of lard, 0.9 C.c. more of solvent is needed above 3 C.c.

And from 40 per cent of lard up to 90 per cent, the total quantity of solvent is about the same as when no butter has been present, counting for each 0.1 Gm. of lard 1.6 C.c. of solvent (see the solubility of leaf-lard).

According to this table, butterine No. 1 would contain about 70 per cent, and butterine No. 2 would contain about 50 per cent of lard, which might not be far from being correct.

If a more soluble lard than leaf-lard was used for mixing with butter, the quantity of solvent used would indicate a larger percentage of lard.

By the butyric ether test, butterine can be easily distinguished from oleomargarin. For the qualitative examination of butter, this method recommends itself by its simplicity, by its easy execution, and by the quickness with which many tests can be made at the same time; and for quantitative examination it is for all purposes exact enough. When once an adulteration of butter is established, it does not matter much whether 5 per cent of admixture more or less are present.

Dr. E. M. Lyon, of Newark, N. J., uses the following formula as a remedy for whooping-cough:

Bisulphate of Quinine..... ʒ i.
Simple Elixir (U. S. P.). .... ʒ iss.

M. A teaspoonful is given every three or four hours to children of 5 years and upwards, until cinchonism is produced; and the patient is then kept under its influence, according to the severity of the paroxysms, for two or three weeks. A lump of sugar saturated with lemon juice is given after each dose.—*Med. Record.*

OIL OF PEPPERMINT.*

BY ALBERT M. TODD.

In the paper which I have the honor to present you, the history of the plant will be briefly noticed, and attention directed to some characteristics of the essential oil as observed in the practical manufacture, some being of such phenomenal nature as to invite further investigation.

Mentha piperita, from which the true oil of peppermint is derived, was first introduced or noticed in Hertfordshire, England, and given the name "peper-mint" by Ray in his "Historia Plantarum," published in 1704. Its commercial history dates from about the year 1750, when its cultivation was commenced in a very small way at Mitcham, in Surrey, England. Fifty years later the amount under cultivation was about one hundred acres, but the growers having had, as yet, no distilleries built, still continued to convey the plant to London for the distillation of the oil.

The industry in England reached its zenith about 1850, just one hundred years after its introduction, when the area cultivated was about five hundred acres, but, owing to successful American competition, it was reduced during the next fifteen years to about two hundred and fifty acres. From personal observation when visiting the peppermint districts of England in 1875, I attribute the success of American competition to a more perfect system of distillation and apparatus therefor (which I will again refer to), and the more healthful growth of the plants in our country.

Distillation of oil of peppermint was first accomplished in America by a Mr. Burnett, in the year 1816, in the county of Wayne, State of New York, who collected on the banks of a little stream sufficient wild plants to produce about forty pounds of the oil. In the year 1835, the industry was established in Michigan, in St. Joseph County, on White Pigeon Prairie, about two miles north of a village of that name, a distillery being erected the following year. Up to this time, and for ten years later, the distilling apparatus used was very crude, being the same as has been used England, with but slight modifications, consisting of a copper kettle in which the plants were placed, immersed in water, to which direct heat was applied by a furnace from beneath, a condensing worm of the usual character being connected with the kettle by a pipe from its apex.

The year 1846 marks a new and important era in the evolution of a more perfect system of distillation and the apparatus therefor, viz., that of distillation by the diffusion of steam through the plants, which were now, for the first time, placed in large wooden vats, to which steam was conveyed by a long pipe entering at the bottom: the kettle which had been used heretofore as the still being now used for the generation of steam. Distillation was now effected in a much more perfect manner, as the scorching of plants and the consequent formation of empyreumatic products was rendered impossible. Furthermore, distillation could now be conducted with much greater rapidity and economy. The primitive stills had a capacity of about fifteen pounds of essential oil in the twenty-four hours, the new form a capacity of seventy-five to one hundred pounds. This system of steam distillation originated in St. Joseph County, Michigan, and was soon introduced into New York.

I might state here that nearly every improvement in the construction of the stills has originated in St. Joseph County, Mich., and it would be of great interest to mark the further development of these improvements to their present high state of perfection, but the limits of this paper render it impossible. On some other occasion I may have the honor to give some practical and technical information relating to the methods of erecting the more perfect plants of distilleries.

Briefly as to the cultivation of the plants: in early spring the ground, having been ploughed, is marked out in furrows two and a half feet apart. In these furrows are placed the roots and runners which have multiplied from the setting the preceding year. One acre of good roots usually furnishes sufficient to set from five to ten acres of new ground. These roots and runners are from one-eighth to one-fourth of an inch in diameter, and from one to three feet in length when in the healthy state. In setting, they are carried in large sacks, strung over the shoulders of the workmen, who place them in the rows so that there shall be one or two living roots or runners at every point in the row. While placing the roots with their hands, they at the same time cover them with their feet. It is quite an interesting sight, owing to the queer motions of the workmen, to see these roots planted. A good, experienced workman, in mellow ground, with good roots, can set about one acre per day. New plants appear above the ground about two weeks after setting, and are carefully hoed and cultivated until July or August, when, if the season is fair, the plants have thrown out such a quantity of runners as to render further cultivation very difficult, and indeed unnecessary.

The proper time for distillation is when the plants are in full bloom in the case of the new crop, that is, the crop which has been set the preceding spring. This usually occurs in September. What is known as the "second crop" (which has sprung up spontaneously, from being the second year's growth) matures usually in August. For distillation, the plants are cut down and allowed to dry for a while in the sun before being drawn to the distilleries. Many growers, however, believing that a loss of the oil is sustained by diffusion in the atmosphere if the plants are fairly dried, bring them to the still in the green state. As distillation can be effected with much greater rapidity from dry plants, this question of thorough drying is one in which the owners of distilleries and the producers in general have long been greatly interested. For, if the plants are worked in the green state, it will require, ordinarily, about ninety minutes for distillation, with a yield of perhaps five to seven pounds of oil to the charge, whereas, if thoroughly dried, distillation can be effected in about thirty-five minutes, with a yield of from eight to nine pounds, since the dried plants will pack much more closely in the vats than the green ones. Each owner of a distillery on the average distils the crops of ten other growers with his own, charging therefor twenty-five cents for each pound of oil obtained, whereas in England the charge is made for each vat of plants, whatever the amount of oil produced.

The former method is much more equitable for the grower, since, if his crop is poor, he is not obliged to pay an exorbitant rate per pound, and the latter method is more equitable for the distiller, since it requires as much labor to distil a charge of poor plants as green and productive ones, and, as stated, much more when the plants are green.

To test the question as to whether a loss of essential oil occurred by diffusion in the atmosphere when the plants were thoroughly dried, I made a careful experiment, the results of which may be found in the *September* number

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* Read at the meeting of the A. P. A.

of the AMERICAN DRUGGIST;* the dried plants used having been exposed to atmospheric action for six months, and having been reduced by such exposure 49.4 per cent in weight. As there are about fifteen thousand tons of the plants produced annually in America, the settlement of this question is of material interest to owners of distilleries and growers; saving the former greatly in manufacturing and the latter in transportation.

The average yield of essential oil varies greatly, according to the quality of the plants, depending mostly on the fact whether they are fine and well covered with leaves and blossoms (in which the essential oil is entirely contained). The difference in quality of plants is so great that, while from two thousand pounds of well-leaved plants I have distilled eighteen pounds of essential oil, but one and one-half pounds have been obtained in some instances from a like quantity of coarse plants devoid of leaves. The average yield, however, is about one-third of one per cent from green plants.

There are now in America about one hundred and seventy-five small distilleries, where the natural oil is distilled. The average annual production in America for the last ten years has been about one hundred thousand pounds of oil. The average yield per acre of the crops of the first and second year is about eleven pounds; this would show an annual area under cultivation of about nine thousand acres.

As to the nature of the essential oil: regarding this there are many tests which are so generally known as not to require notice at this time. Some of them may, however, be briefly stated. Oil of peppermint, when freshly distilled, or when two or three years of age, if kept in well filled vessels, should dissolve readily in alcohol in all proportions, making a clear solution without need of filtration. When a few drops of the oil are placed upon white paper and held over a lamp or gas jet, it should volatilize quickly and perfectly without undergoing change or leaving any residue. When three drops of peppermint are placed upon four grains of resublimed iodine (or such quantity as will thoroughly saturate, but not drown the iodine) there should be but a slight reaction, and what little vapor is produced should be almost invisible, becoming entirely so after having arisen about twelve inches above the mixture, the color of the vapor assuming a bluish cast. The color of the mixture in this test should be carefully noticed, which, in the case of pure peppermint, is of a brown, or brownish-black color, the iodine dissolving slowly and imperfectly. If oil of turpentine, erigeron, fire-weed, rag-weed, or other terebinthinate oils are present, there will be quite a violent reaction (according to the quantity of the adulterant), with the evolution of considerable heat, and a red or reddish-yellow vapor will be produced, of a rank odor, partaking considerably of the nature of the adulterant, and the mixtnre will change to a bright violet. If the color of the mixture is most carefully noted, a very slight quantity of such adulterants can be detected. When to twenty-five drops of alcohol one drop of nitric acid sp. gr. 1.2 is added, and then one drop of pure oil of peppermint, there will be produced, within about a half hour, a blue or bluish-green color, which will remain permanent for a long time. Oil of pennyroyal and Mentha arvensis produce no coloration. A much more intense coloration will be produced when one drop of nitric acid, of the strength as stated, is mixed with fifty or sixty drops of the essential oil, without alcohol. Some specimens of oil of peppermint imported from Germany and England showed by this test a mixture with Mentha arvensis. To make this test valuable, however, to chemists and pharmacists, they should first operate upon samples of known purity and notice the depth of coloration required.

Another test for the detection of pennyroyal, which also indicates Mentha arvensis when in sufficient quantity, is the following: Take one drachm each chloral hydrate and pure sulphuric acid, adding twelve drops of alcohol. When this solution is mixed with a like quantity of pure oil of peppermint, a dark cherry color is quickly produced and maintained for a long time. Pennyroyal (or oil of peppermint heavily adulterated with this oil) gives no such color, being more of a yellowish cast, and changing to an olive green. With Mentha arvensis a yellowish-brown color is produced which is maintained for ten or twelve hours, and thirty-six hours later has a slight tendency to assume a cherry color or one intermediate between the cherry and the brown. It was noticed that, when the true oil of peppermint was mixed in equal proportions with that of the Mentha arvensis, a deficiency in the intensity of the cherry color was plainly observable. Whether the significance which I have discovered in these tests, showing similar reactions in pennyroyal and Mentha arvensis, has a bearing on the chemical relationship of the oils of these plants which are related botanically, is a question of interest.

I will now refer to the two physical tests, those of specific gravity and boiling point, in which the results of my experience vary greatly from the tests published in official and standard works.

The difficulty which scientific men seem to have experienced in establishing accurate tests for the purity of essential oils has been, that they could not conveniently obtain the plants from which they themselves could distil the specimens used in their investigations; and while undoubtedly every possible precaution was taken, the result shows that they have in many instances operated upon impure samples; and although pure specimens undoubtedly were in some instances received, yet they had, in many cases, no positive knowledge *per se*, which were pure and which were impure, hence too great a range of differences has been allowed in physical characteristics and chemical reactions. In correspondence with some well-known chemists, they give it as their opinion that a wide range of specific gravity, etc., might result from variations in soil and climate. On account of this we took greater pains to verify our determinations by testing samples grown under much varying conditions of soil and climate, both in Europe and America. Forty-three samples were examined, including oils produced in St. Joseph, Wayne, Ionia, Hillside, and Kalkaska Counties, Michigan, Wayne County, New York, and vicinity (all of which were produced from American roots long acclimated), also one specimen grown in America from roots imported from England, and one specimen grown and distilled in England. The sp. gr. has been variously stated in the dispensatories and other standard works at from 0.840 to 0.950 at 60° F. But there were none of the samples which were pure which had a sp. gr. below 0.910 at 60° F., except the two last mentioned, grown from English roots; the one grown in America being 0.9085, the one distilled in England being 0.9088. Nor were any specimens of pure oil found having the sp. gr. above 0.917 which were in a perfectly soluble condition. One sample distilled by myself in 1875, and consequently eleven years old, had, on account of its age, a sp. gr. of 0.924; one sample from New York 0.933, and from the same district 0.940 for another. However, those three samples were found to be readily soluble, the latter sample, when submitted to rectification, being found to contain nine per cent of insoluble resin. Of five samples imported from Europe, but one was found pure; two from Germany were found to contain dementholized Mentha arvensis; one from London, which bore a fraudulent and forged label (as Michigan Oil of Peppermint, manufactured at Evart, Michigan County, U. S.),* had the sp. gr. 0.899. This oil, when submitted to fractional distillation, was found to contain *fifty per cent oil turpentine and no Michigan peppermint whatever.* The sample imported from London as German oil of peppermint consisted chiefly of pennyroyal and Mentha arvensis. Allowing a slightly wider range of difference than was really intended, it is evident that whether from English or American plants, pure oil of peppermint is never below 0.908 sp. gr., nor, when fresh and soluble, above 0.917 sp. gr., so that the difference formerly allowable, that is, from 0.840 to 0.950, is reduced to one-tenth.

As to the boiling point; this is stated in the Dispensatories at 365° F., and 374° F. By placing the oil of peppermint in a distilling flask, the body of which was immersed in a mercury bath, and attached to the condenser, the following times and temperatures were noticed, the distilling being divided into eight fractions. Applying the heat slowly, the *slightest possible* ebullition was noticed at 363° F., but so slight as to be almost imperceptible. Ten minutes later the temperature had risen to 401.5° F., at which time *but two drachms* of fluid were collected, *one half of which was found to be water.* It will hence be observed that the true boiling point *of the oil* could hardly be placed below 409° F. Ten minutes later the temperature had risen to 406.9° F., with distillation progressing at the rate of but six drops per minute, and it was found, upon reducing the temperature to 406°, that the speed of distillation was reduced to one drop in forty-two seconds; so that the first fraction could not be recovered easily, except at a temperature higher than this. Counting from the time when the oil commenced to drop into the receiver, the distillation of the first fraction of one ounce occupied fifty minutes, being concluded at a temperature of 412.8° F. It would seem, then, that the *true* boiling point should not be placed below 400° F.

I would here call the attention of the Association to the need of a more definite and complete method for recording experiments in fractional distillation, in which not only the form of apparatus and method of applying the heat should be noticed, and the temperatures of each fraction, but also the speed at which it is effected in its various stages. This matter would form a very interesting matter for discussion. I will now call attention to one phenomenal characteristic observed in fractional distillation, and which I briefly alluded to one year ago, that is, the changes of direction from the ascending to the descending scale in the specific gravity of the different fractions. It had formerly been supposed that the specific gravities increased constantly after the first until the last fraction was obtained. The law discovered is that when the distillate is divided into a number of fractions, the specific gravity continued to rise only until about half the oil is recovered, they then strangely commence to descend until until 80% or 90% is obtained, and the point is reached of the specific gravity about as low as that of the third fraction. The direction now again changes to an ascending scale, increasing with great rapidity. To illustrate this, I

* Our preceding number, page 161.

* See this journal, September, page 161.

will give you the specific gravities obtained in the distillation of three hundred pounds oil of peppermint by the diffusion of steam. The times and temperatures and other conditions will be referred to in some future paper.

The specific gravities were as follows:

Number of Fraction.	Specific Gravity.	Number of Fraction.	Specific Gravity.
1.....	0.89423	8.	0.91275
2.....	0.90650	9.....	0.91175
3.....	0.91000	10.....	0.91100
4.....	0.91275	11.....	0.91075
5.....	0.91375	12.....	0.91065
6.....	0.91400	13.....	0.91050
7.....	0.91425	14.....	0.91265

There now remains in the still one full fraction of twenty pounds not yet recovered; subdividing this fraction, the following specific gravities are found: The first five pounds is 0.925; the next two pounds 0.955, and the distillation being continued as far as possible, the last portion obtained is four ounces sp. gr. 0.970. There now remain in the still twelve pounds fourteen ounces of resin, which if mixed with seven pounds four ounces last obtained, would raise the sp. gr. of the last full fraction to about 0.980.

In calling the attention of Prof. Flückiger, of Strassburg, to the subject, he attributes it to the splitting up of the component parts. This, however, seems hardly possible when the aroma and chemical reactions of the fractions are investigated.

There are other tests and characteristics of interest which I would gladly notice if time permitted, but which will better form the subject of a future article.

Iodoform Poisoning. — Dr. E. G. Cutler, of Boston, after a very complete paper on the subject of iodoform poisoning, in the *Boston Medical and Surgical Journal*, advises:

(1) Fresh wounds or unhealthy or tuberculous surfaces are the only ones fitted for the application of iodoform.

(2) Only a thin layer or small amount of iodoform is to be applied.

(3) When granulations appear healthy, iodoform should be omitted and some other non-poisonous substance substituted.

(4) At the first symptoms of poisoning, or coincidently with the original use of it, compounds of the alkalies and vegetable acids are to be given by the mouth at frequent intervals, as acetate of potash. If severe symptoms supervene, transfusion with common salt solution is to be resorted to, and the wound is to be washed free from iodoform with pure water and an alkaline carbonate solution, and afterward powdered magnesia is to be dusted on.

The Preparations of Ergot have been the subject of experiments by Kobert, of Dorpat, and he makes the following deductions: *Ergotinic Acid* possesses no oxytocic properties. Ergotine, in the crystalline form, has no action whatever on the uterus. *Cornutin* has a direct action on the uterus, causing contractions that are the more violent the further advanced the subject is in pregnancy. Sphacelinic acid exerts a peculiar effect on the uterus, not provoking rhythmical contractions, but a tetanus-like action. Since ergot that has been kept more than a year is absolutely inert, and yet the physician has no means of telling an old specimen from a fresh one, except by the effects, ergot should be abandoned entirely and cornutin substituted for it, for the latter really contains the active principle of *Secale cornutum*, and does not lose its power after being kept for several years.—*N. Y. Med. Jour.* after *Ctrlb. f. Gynäk.*

AMERICAN PHARMACEUTICAL ASSOCIATION.

THE thirty-fourth convention of the American Pharmaceutical Association took place at Providence, R. I., on the 7th, 8th, and 9th of September, under the presidence of Mr. J. Roberts. In his opening address, the President, referring to resolutions recently adopted by the Maryland Pharmaceutical Association, relative to the increasing use of proprietary remedies, said:

The resolution is a step in the right direction, but possibly does not go far enough. It is by the aid and countenance of physicians that this evil can be controlled and lessened. Physicians, if properly approached, will ever be found ready to aid and foster with their best efforts all measures in the interest of pharmacy that will inure to public good. If the intent of this resolution, amplified and indorsed by this Association, and possibly supplemented by the conjoint action of the various State Pharmaceutical Associations invoked by the direct appeal of this Association, were put into proper shape and brought to the attention of physicians by direct communications officially with the many medical associations throughout our land, I believe it would go far to correct the evil. The resolution should recognize the fact that the many preparations now in popular use that may be grouped under the head of so-called "elegant pharmacy" have become such fixtures in our business that it will not do to ignore them, and embrace in its request that physicians confine their prescriptions to official remedies, and such non-secret, non-proprietary remedies as may be indorsed by, and the formula for which is published from time to time under the sanction of this Association.

The address made reference also, to modifications in the constitution and by-laws; the establishment of a reserve fund, and to the qualifications for membership. The following resolution, referred by the Council to the Association for action, was presented with the President's indorsement:

. "That a committee be annually appointed, to be known as the Committee on Materia Medica or Pharmacognosy, to consist of five members, whose duty it shall be to investigate and report annually on the origin, source, and value of new remedies, such as are brought to the notice of the medical and pharmaceutical professions, the committee to represent the different sections of the country."

Finally, the President referred to the rapid multiplication of colleges of pharmacy, and said:

"That colleges of pharmacy may be multiplied without detriment to the status of pharmacy is a truism that none will deny, provided, however, that they maintain that high and ascending scale of qualifications of the students of pharmacy that all well-wishers of true pharmaceutical progress have for many years past demanded should, as a rule, be observed in their education. For, surely, as the opportunities for acquiring knowledge afforded the student of pharmacy are multiplied, so should a demand for greater proficiency be exacted from them. It is from a fear that a rapid increase of colleges of pharmacy may beget a spirit of commercial rivalry in competition for students that might lower the standard of excellence demanded of them. In my opinion it will be wise for all well-wishers of our profession to hesitate; to be well assured that there be an actual need of a new college of pharmacy in the locality in which it is proposed to establish it before lending their aid and countenance to the project."

REPORTS OF COMMITTEES.

The Special Committee on a National Formulary presented an elaborate report containing the following propositions:

1. Scope of the National Formulary.—The National Formulary, to be published under authority of the American Pharmaceutical Association, may contain the formulas of such preparations as have either been formerly officinal in the U. S. Ph., and have been discarded, though still in demand; or such as have never been officinal, but deserve recognition, because more or less generally in use. Among the latter may be any preparations contained in foreign pharmacopœias, if there is known to be a sufficient demand for them in any section of this country. It shall also contain the preparations belonging to so-called "elegant pharmacy," but it shall not be encumbered with purely technical, trivial, or fancy preparations.

2. System of Weights and Measures.—The National Formulary shall direct the quantities of the ingredients of such liquid preparations as are prescribed or administered by measure, in apothecaries' weight and United States measure. The same may be done in all other cases, but the system of "parts by weight" may be used where it appears to be more natural and convenient.

3. General Duties and Functions of the Committee.—A. The committee to which is assigned the duty of preparing or revising the National Formulary shall take charge of all the documents regarding the matter which may be presented to the Association. And all associations or individuals are requested to forward their contributions, as early as possible, to the committee. The committee is often compelled to decide between the merits of rival preparations, and heretofore it has been able to do this only by making the preparations itself. This method, however, has been found not to be sufficiently free from the risk of a failure to appreciate the particular meritorious feature that may be claimed for the preparations in question. It is deemed absolutely necessary that, in all doubtful cases, the proposer of a formula should furnish a sample of the preparation as made by himself. The Association therefore requests that when the committee call upon any individual, or upon any other formula committee for samples of any proposed preparations which it may need for reference and comparison, these samples be promptly furnished. And the committee shall not be held responsible for modifying or ignoring formulas of preparations, samples of which have not been furnished when so requested.

B. The committee having perfected the compilation of the National Formulary, or any subsequent committee having accomplished its revision—in case the Association shall approve the work—shall supervise and have sole charge of the printing of the text of the formulary. It is only when seeing the final text before them, with opportunity to refer at any time to formulas already passed upon and printed, that a harmonious text can be obtained. Each member of the committee should receive a proof, the corrections should be compiled by the chairman, and all matters that may be under dispute decided by a vote without delay. Hence, though a new committee may be appointed at any meeting of the Association, the previous committee shall not be considered discharged—if the whole text of the formulary is involved—until it has seen its own work through the press. And the printing of the work shall be taken in hand immediately after the annual meeting. Arrangements for the printing shall be made by the Publication Committee of the Council. Nothing contained herein, however, is intended to prevent any new committee from organizing and beginning work immediately after its appointment.

4. Publication of the National Formulary.—The National Formulary, after being finally compiled and adopted, shall be printed in the Proceedings, and also in pamphlet form, in which latter shape it shall be kept for sale. (How frequently the Formulary, as a whole, is to be revised, and whether any needed additions may for several years temporarily be deposited in the Proceedings, or otherwise, may be better determined some time after the Formulary has been in use.)

5. Publication of the Preliminary Draft of of a National Formulary herewith Submitted.—The Draft of a National Formulary offered by your committee shall be printed immediately after the present annual meeting, under arrangements to be made by the publication committee of the Council, and the printing shall be supervised by the committee. In printing this Draft, econ-

omy of space is recommended to be studied, and formulæ which are already easily accessible in separate pamphlets may be only quoted by title (references being given), except when remarks are to be appended. This Draft of a National Formulary shall be printed to the number of 250 copies beyond those required for the proceedings, the separate copies being placed at the disposal of the committee for distribution to outside committees and to individuals.

These propositions were adopted by the Association, together with the recommendation by the committee:

That another year be devoted to further critical examination of the formulas presented, as well as of those contained in any other collections or drafts which have not yet been considered for want of time, or which may be presented by other bodies hereafter, and that the same plan which has been followed during the preceding year should also be followed in the future, namely, that the committee having the matter in charge should be so chosen that its members are within easy reach of each other, so as to be able to hold frequent meetings. A committee scattered all over the United States may, perhaps, be perfectly successful in revising such a work as the Pharmacopœia—the draft of which is already in existence for the use of the revisers, who may distribute the work of revision among themselves. It is different, however, with a Formulary of Unofficinal Preparations, which has to be, as it were, built up from the foundations with material brought together from all parts of the compass. There should be numerous helpers and agents in every State, but the working members of the committee should be within each other's reach, and able to hold frequent meetings.

The following resolution was subsequently adopted:

Resolved, That in addition to the five members from New York and Brooklyn there shall be appointed one person from each State Pharmaceutical Association, all of whom shall constitute the Committee on National Formulary, and that five members thereof shall be a quorum for the transaction of business.

The Committee on Membership reported that the number of members as per last report was 1,324; since added 35; total 1,359; loss by resignation, dropped, and death, 65; membership in good standing 1,294; honorary membership 26.

The Treasurer's Report showed balance on hand as per last report, $4,217.79; receipts, $5,402.64; total, $9,682.43; expended, $5,184.34; balance to new account, $4,501.09; investments, $3,765.94. The treasurer tendered his resignation.

The Committee on Legislation reported concerning the proposition to secure the publication of formulas of proprietary remedies, and recommended that information relative to the subject be printed and distributed among the legislative bodies of the various States. Resolutions to strike out the preamble and resolutions, and to lay the report on the table were defeated, and the report was ultimately accepted and adopted.

The Committee on the Drug Market stated, among other matters referred to, that

"There had been an increased demand during the year for an article that is doing incalculable injury to the fair fame of the profession of pharmacy." This refers to what the enterprising bottlers are pleased to call malt whiskey. The report states: 'It is a matter of the profoundest regret and a cause of humiliation that this argument has been greatly weakened by the fact that certain concerns engaged in wholesale liquor business conceived the idea that a favorable opportunity offered to increase sales of what may or may not be articles of merit by forcing them through the respectable channels offered by the drug trade. Physicians' certificates, by the column, indorse it whether true or false, and the movement has swept through the country. Many conscientious druggists for a long time absolutely refused to yield to this demand, until driven to it by physicians prescribing the article. It would be well for this respectable body to take special cognizance of this latest outrage upon the dignity of the profession and devise by the next annual meeting some means to conquor or at least render harmless this medicinal (?) enemy. We have watched this tide, swelled by printer's ink, sweeping the country and threatening to engulf the fame of the profession, and asked what outrage may we look for next? The question is, must it go on, or will you dump this class of merchandise into the grog shops, where it belongs?'"

The Committtee on the President's Address submitted, among others, the following resolutions:

Resolved, That this Association solicit the aid and coöperation of the American Medical Association in promoting the prescribing by physicians of official medicines only, or of such preparations as have published formulas in preference to others, and that the several State Pharmaceutical Associations make similar requests of their respective State Medical Associations.

Resolved, That a committee of five be appointed, whose duty it shall be to inquire if there be a better plan for the management of this Association than the existing one, said committee to be appointed by the chair, and to represent the various sections of the country.

Resolved, That the committee on publication are hereby instructed to have the annual proceedings published and ready for distribution on or before January the first. And they are also instructed to omit from said publication any papers that may not be in their possession in proper time for the execution of this resolution.

Resolved, That the multiplication of colleges of pharmacy should be discouraged except where the need of them is undoubted.

The committee also recommend the abolition of the initiation fee.

The Committee appointed to memorialize Congress to appropriate money to introduce the cultivation of foreign medicinal plants report that they have decided, after consultation with the Commissioner of Agriculture, that such action will be unnecessary. That official expressed himself willing and anxious to undertake the task, and desired a list to be furnished him of seeds and plants most desirable to be used. It was voted that a committee be appointed to prepare a list of such, to be given to the Commissioner of Agriculture.

The Committee on Nominations reported the following list of officers and committees for the ensuing year:

President.—Charles A. Tufts, Dover, N. H.

Vice-Presidents.—Henry J. Menninger, Brooklyn, N. Y.; M. W. Alexander, St. Louis, Mo.; N. A. Kuhn, Omaha, Neb.

Treasurer.—S. A. D. Sheppard, Boston, Mass.

Secretary.—John M. Maisch, Philadelphia.

Reporter in Progress of Pharmacy.—C. Lewis Diehl, Louisville, Ky

Committee on Legislation.—T. L. A. Greeve,* Cincinnati; John M. Maisch, Philadelphia; Edward Bocking, Wheeling, W. Va.

Members of Council.—George W. Kennedy, Pottsville, Pa.; A. H. Hollister, Madison, Wis.; William H. Rogers, Middletown, N. Y.; J. C. Candidus, Mobile, Ala.

Committee on Drug Market.—George J. Seabury, New York; Mahlon M. Kline, Philadelphia; E. Waldo Cutler, Boston; Daniel Myers, Cleveland; C. T. G. Meyer, St. Louis.

Committee on Papers and Queries.—Virgil Coblentz, Springfield, Ohio; Wm. W. Bartlett, Boston; E. Painter, California.

Committee on Prize Essays.—C. Lewis Diehl, Louisville; Emil Scheffer, Louisville; Rosa Upson, Marshalltown, Iowa.

* Mr. Greeve having declined, Mr. Ch. W. Day was subsequently elected.

The report was adopted, Mr. Seabury declining to serve, and Alfred H. Mason was subsequently appointed chairman of the Committee on the Drug Market.

OTHER RESOLUTIONS ADOPTED.

Postponing the report of the Committee on Reorganization until 1887.

Reducing the initiation fee from $5 to $2.

Adopting Cincinnati as the place for the next meeting, on the first Monday of September, 1887.

Thanking the Rhode Island Pharmaceutical Association for its efforts in behalf of a successful meeting.

Expressing sympathy for the pharmacists in Charleston, S. C., who have suffered from the recent earthquake.

Expressing the thanks of the Association to the Governor of Rhode Island and the Mayor and citizens of Providence for the cordiality of the reception given to the Association, and to the newspapers for their reports of the meeting.

Referring to the Publication Committee the propriety of printing, in advance of the meeting, all papers presented.

Reducing the salary of the Treasurer from $750 to $600.

Telegraphing the thanks of the A. P. A. to the San Francisco pharmacists for their invitation of the Association to meet in that city in 1887.

To receive the delegation from the National Wholesale Druggists' Association.

Admitting to the privileges of the meeting Mr. Alfred H. Mason, of Liverpool, England, Colonial Secretary of the British Pharmaceutical Congress, together with the druggists and physicians of Providence.

PAPERS ON SCIENTIFIC AND OTHER TOPICS.

"Pharmacy of Hydro-Naphthol," by THOMAS D. MCEHENIE; "Butter and Its Substitutes," by E. SCHEFFER; "Some Notes Concerning the Carbolic Acid Made in America," by E. M. HATTON; "What is the best Paste for Pasting Labels, and how can Paste be best Prepared?" by LEO ELIEL; "What should be the Relation between the Wholesale Druggists, Manufacturing Chemists, and Pharmacists as to the maintenance of proper standards of purity, quality, and strength of medicinal substances?" by J. M. GOOD; "Does Cannabis Indica Contain Nicotine?" by GEORGE W. KENNEDY; "Is it not Feasible to Prepare Concentrated Liquid Preparations from many drugs which need only be diluted with the appropriate menstruum to bring them to the officinal strength, without having them differ in any important point from the weaker preparations directed by United States Pharmacopœia?" by J. L. LEMBERGER, Lebanon, Pa.; "What is the Quality of the Belladonna Leaves of Commerce?" S. D. LYONS; "What is the Quality of the Balsam of Tolu of Commerce?" P. W. BEDFORD; "Dioscorea Bulbifera," J. U. and J. G. LLOYD; "Evaporation of Percolates," J. U. LLOYD; "Guarana—Methods for its Assay and the Assay of its Fluid Extract," H. W. SNOW, Detroit; "An Analysis of the Underground Portion of Phlox Carolina," H. TRIMBLE, Philadelphia; "Ginger in Soluble Essence," LUTHER F. STEVENS; "Abstracts" (continued), VIRGIL COBLENTZ, Chicago; "Glycerin and its Uses," GEORGE C. CLOSE; "Notes on some of the Quinias," H. F. CUMMINGS; "On the Best Methods of Determining Melting Points," HENRY C. C. MAISCH, Philadelphia; "On the Oil of Peppermint," A. M. TODD; "Decease of the West Virginia Pharmaceutical Association," EDMUND BOCKING; "A Study of Peptonization and Pepsin," DR.

R. G. ECCLES; "Nitrous Ether," EMLEN PAINTER.

NEW MEMBERS.

Fred. W. Fink, New York; Henry A. Sasterbrook, Fillburg, Mass.; August Gresham, Newark, N. J.; Albert S. Dolloff, Lake Village, N. H.; Gus Dresser, Putnam, Conn.; C. J. McCarthy, Shenandoah, Pa.; Arthur B. Houson, Chillicothe, O.; D. F. Downing, Newport, R. I.; C. T. Fennell, Cincinnati, O.; Clark Z. Otis, Binghamton, N. Y.; C. V. Stryker, Philadelphia, Pa.; Benj. F. Gnadenbush, New York City; A. Thurston, Grand Rapids, Mich.; W. E. Warer, Keyport, N. J.; J. Leroy Leyberg, Detroit, Mich.; Willis G. Gregory, Buffalo, N. Y.; Ed. D. Wright, New Bedford, D. Frank Hayes, New York; Henry Schmidt, Joseph Miller, Plainfield, N. J.; Fred. B. Kilmer, New Brunswick, N. J.; Amos H. Coffee, Carthage, Mo.; Goodwin R. Wiley, of Bethel, Me.

N. R. D. A.

THE National Retail Druggists' Association assembled at Providence, R. I., on the 6th of September, and dissolved the organization. On the following day, the Association was reorganized on a new basis, providing for a membership consisting of delegates from State pharmaceutical associations with more than twenty-five members, in the proportion of one delegate for every hundred members or fraction of that number. From States where no State organization exists, delegates may be sent, upon the same basis, by local organizations.

The finances of the old organization consisted of $132.32 of cash on hand, with an indebtedness of $300 for salaries in 1884. The officers to whom salaries were due having waived their claims, the balance on hand was directed to be given to the former Treasurer.

The following officers were elected:

President.—A. Hollister, of Wisconsin.

Vice-Presidents.—M. W. Alexander, of Missouri; P. C. Candidus, of Alabama.

Secretary.—L. E. Nicot, of New York.

Treasurer.—F. H. Masi, of Virginia.

Committee for Conference with the American Pharmaceutical Association.—E. A. Sayre, L. E. Nicot, Rosa Upson, A. H. Hollister, and T. R. Baker.

Executive Committee.—H. Cumming, of Massachusetts; T. J. Macmahan, of New York; R. Vandervoort, of New Jersey, and H. I. Leith, of Rhode Island.

Committee on the Exhibition.—Messrs. Van Sant, Macmahan, and Kuhn.

Resolutions of thanks were adopted to the exhibitors and to the Local Committee, and particularly to Mr. H. I. Leith, the Local Secretary.

The next meeting will be held at the call of the President.

Poisoning by Permanganate of Potassium.—Dr. W. D. Bidwell, of Leavenworth, Kan., sends to the *Boston Medical and Surgical Journal* an account of his experience in the use of the permanganate of potassium in amenorrhœa. In several cases in which the medicine was given in two-grain capsules thrice daily, it caused burning pain in the stomach, and generally symptoms of shock or collapse, which sometimes persisted two or three days. In some of the cases, it also produced nausea and vomiting.

Olive Oil is adulterated in France to such an extent with cotton-seed oil that it has seriously affected the production of the former.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 1,773.—**Prescription Difficulty: Morphine and Compound Tincture of Lavender** (W. F. B.).

We have answered this query in our last number (September, page 179, Query 1,768).

No. 1,774.—**Tints for Face Powders** (F. P. Y.).

A fine flesh color is imparted to face powders by intimately mixing with them the proper quantity of *carmine* or of *eosine*. The former is best triturated with talc, in the proportion of 1 part of carmine to 3 of talc, and a sufficient quantity of the mixture incorporated with the face powder to produce the requisite tint. It depends upon the nature of the constituents, how much of the mixture would be required. This is, however, so easy to ascertain by a simple trial, in each case, that you will have no difficulty in fixing the proportion.

If eosine is used, it should be dissolved in water, say, 1 part in 20, and a sufficient quantity of this added to powdered talc to impart to the latter a deep tint. This tinted talc can then be used for mixing with the face powder. Or, the proper amount of eosine solution, more or less diluted, may be added to the face powder direct.

The flesh tint of both the carmine and eosine may be rendered more natural by combining it with a certain proportion of aniline orange. What the proportion should be depends on the quality of the colors and the individual judgment.

By proportionately increasing the orange, a brunette color may be produced, which, when properly diluted (with a white powder, such as talc), has a creamy tint.

The previous communication you refer to did not reach us.

No. 1,775.—**Bleaching Wax** (W. K., Parras, Mexico).

The best method of bleaching beeswax is that by exposure to moisture and the rays of the sun. To expedite the process, it is necessary that the wax be in very thin slices, which is accomplished in various ways. One of these is as follows: Beeswax is melted in a suitable kettle. Alongside of this is a box made of tinned iron, which has a number of narrow slits in its bottom. Immediately below is a wooden cylinder on an axle resting in bearings, half of the cylinder being immersed in cold water. One of the workmen pours the melted wax, by means of a ladle, into the box, whence it issues in a thin stream through the slits, and flows upon the wooden cylinder which is turned by another workman. It thus winds itself upon the cylinder in very thin sheets, which fall into the water in more or less large pieces. Ormelted wax is projected from a revolving kettle, provided with one or more faucets, in a fine stream or almost spray, which is caught by very cold water. The division of the wax by this method is so great that the bleaching process takes only about one-third the time of that required for band-wax.

The prepared wax, whether in sheets, bands, or grains, is transferred to muslin stretched upon wooden frames, and then exposed to the sun. It is moistened at least once daily with water, and must be repeatedly turned over so as to expose a new surface to the sun. It depends upon the amount of sunlight, temperature, and care bestowed upon it, how long a period is required for the bleaching. When it has become perfectly white, the wax is melted in hot water, strained, and then poured into forms.

Band-wax is liable to be bleached only to a certain depth, while the interior remains yellow. It must, therefore, usually be remelted, again formed into bands, and again bleached until it is perfectly white, which sometimes requires as much as five weeks, and involves a loss of from 2 to 10 per cent of the wax.

Grain wax is much more easy to bleach. It is, however, necessary to make experiments on a small scale, whether any given kind of wax is capable of being bleached at all, which is not always the case.

The bleaching process is, of course, accomplished by the agency of ozone, which is present when moisture and sunlight act upon the wax. The knowledge of this fact has suggested the employment of certain substances which are themselves strong ozone generators, and the time required for bleaching has, indeed, been diminished thereby to a period of only six to eight days, while formerly from three to five weeks were necessary. The improved process consists in melting together, at a gentle heat, eight parts of yellow beeswax and one to one and one-half parts of rectified oil of turpentine, free from resin, and treating this mixture in the same manner as has been described above. The bleaching will be accomplished in six to eight days, and the wax will have lost all trace of the odor of turpentine.

Ribbon or grain wax may also be bleached very quickly and effectively by means of peroxide of hydrogen, which does not affect its chemical constitution. But chlorine gas, chloride of lime, permanganate of potassium and other powerful chemicals cannot be used for this purpose, as they alter the constitution of the wax.

No. 1,776.—**Morphine Habit** (J. A. H.).

This correspondent asks: "What remedy or what drug is usually used to break off the habit?"

To this query we can give no direct answer, as there is no remedy or drug which, by itself, can accomplish the cessation of the morbid craving for the baneful narcotic. The only effective cure—and it is often merely temporary—is a restoration of the will-power and self-control, to be brought about by a careful and judicious treatment, and a restraint from habits of dissipation or idleness.

The so-called "Antidotes for Morphine," or "Remedies for the Opium or Morphine Habit," are merely traps for catching the money of the unfortunate victims, and, if any should succeed in allaying the craving for opium or morphine, they have become so necessary as substitutes that the cure is often worse than the disease.

No. 1,777.—**Formularies** (M. L. P.).

This correspondent wants to know what are the best formularies "for the guidance of pharmacists in making the various preparations?"

As our correspondent is a physician, we presume we need not tell him that the pharmacopœia is the legitimate guide for all preparations contained therein. As to unofficinal preparations, there is a prospect that a National Formulary of Unofficinal Preparations will be completed during next year, on or before about September, 1887, which will be published by the American Pharm. Association. For the present, there are a number of formularies in use, some of them embracing rather the so-called "elegant preparations," while others are of more general character. The New York and

Brooklyn Formulary has undoubtedly had the largest circulation of any local work. Other local formularies, which have been prepared for similar purposes, are those published by the Kentucky and the Pennsylvania Pharm. Associations. Another was published by a joint committee of physicians and pharmacists in Washington, and still others elsewhere. There is not one which does not contain preparations omitted in one or more of the others. Besides, there are the formularies published by individual authors, a list of which you may obtain from some book-dealers, for instance, J. H. Vail & Co., 21 Astor Place, New York. These works contain many preparations of similar or identical titles, which differ greatly in their composition, and one and the same preparation is often directed to be made in a different manner, or of a different strength, or from different ingredients by the various authors. As long as there is no *national* standard, it would be impossible for us to say which authority you should follow.

No. 1,778.—**Easton's Syrup** (C. E. H.).

A formula for Easton's Syrup (*not* Eaton's, as several authors have it) was introduced into the last U. S. Pharmacopœia, under the title *Syrupus Ferri, Quininæ et Strychninæ Phosphatum*. When prepared by the officinal process, the syrup keeps better than when made after the old method, by dissolving the bluish phosphate of iron in phosphoric acid. Nevertheless, a slight precipitate will generally form after some time, and we have not seen *any* Easton's Syrup which would not deposit some little sediment after having been made. When the deposition has been completed and the clear syrup is removed, no further change occurs, if it is kept well. The deposited matter is mainly a basic phosphate of iron.

The original formula for Easton's Syrup was published (according to Mr. Martindale) in Aitken's "Practice of Medicine," vol. II., p. 62, 5th ed. From the fact that Aitken published it, it has also received the name: *Aitken's Syrup*. According to Mr. Martindale, it may be more conveniently prepared, and keeps better, if made as follows, (British weights and measures):

Strychnine	8 grains.
Phosphoric Acid, syrupy, sp. gr. 1.500.	2 drachms.
Quinine, pure anhydrous	192 grains.
Sugar	5 oz.
Distilled Water, enough to make	6 fl. oz.

Dissolve the strychnine in 3 fl. oz. of water, previously mixed with the phosphoric acid; then add the quinine, heat until it is dissolved, filter while hot, and add the sugar. Dissolve with the aid of heat, strain, and make up with water to 6 fl. oz.

Instead of the quinine, 224 grains of phosphate of quinine may be used, in which case only 1 fl. drachm of phosphoric acid is requisite.

This is a *concentrated* preparation and must be carefully labelled and kept, to prevent mistakes. Label it: *Concentrated Solution for making Easton's Syrup.*

Mr. Martindale found that if the solution of the alkaloids is kept apart from the phosphate of iron, there is much less tendency to precipitate. The darkening of the syrup is also prevented, which Mr. Martindale ascribes to some reaction between the solution of phosphate of iron and the phosphate of quinine, independently of the presence of sugar.

The other portion of the syrup is prepared in the following manner, according to Mr. Martindale's improvement upon the formula in the British Pharm.:

Syrupus Ferri Phosphatis.

Iron Wire, bright	360 grains.
Phosphoric Acid, syrupy, spec. gr. 1.500	7 fl. oz.
Syrup (cold)	72 "
Distilled Water, enough to make	96 "

Place the iron wire, phosphoric acid, and 8 fl. oz. of the water into a glass flask, taking care that the iron wire is completely covered by the liquid, plug the neck with cotton wool, and set it aside for 2 or 3 days to dissolve. Then filter, add the syrup, and lastly, enough water to make 96 fl. oz.

When *Easton's* (or *Aitken's*) *Syrup* is called for, prepare it by mixing

Concentrated Solution for making Easton's Syrup	1½ fl. oz.
Syrup of Phosphate of Iron	6½ "

Each fluidrachm of this contains 1 grain of phosphate of iron, about 1 grain of phosphate of quinine, and $\frac{1}{12}$ grain of strychnine.

No. 1,779.—**Deodorizing Gelatin** (M. J. E., California).

We do not think it practicable to deprive commercial gelatin of any disagreeable odor which it may possess, on a small scale. This ought to be done in the course of manufacture. There is no difficulty in obtaining gelatin free from odor, if you will purchase the qualities used for culinary purposes. If a coarser kind of gelatin is to be used, we think it more convenient to cover any fetid odor it may possess by the cautious addition of some pleasant volatile oil, or other aromatic substance, added in just sufficient quantity to disguise the objectionable smell.

AWFUL EXAMPLE.—Yes, gentlemen, I am a reformed man!
LADY.—Good heavens! what must he have looked like before he reformed?

No. 1,780.—**Syrupus Codeinæ** (M. J. E., California).

Syrup of Codeine is officinal in the French Pharmacopœia. The mode of preparation is as follows:

Codeine in powder	0.20	gr. 3
Alcohol of 60%	5.00	♏ 90
Syrup	95.00	fl. ℥ 2½

Using the officinal alcohol of the U. S. Ph., and calculating the amounts necessary for 1 pint, the following would be the formula:

Codeine, in powder	gr. 18
Alcohol, U. S.	6 fl. drachms
Water	3 fl. drachms
Syrup, enough to make	16 fl. oz.

Dissolve the codeine in the alcohol and water previously mixed. Then add enough syrup to make 1 pint. Each fluidrachm contains about ¼ grain of codeine. It might be advisable, if a formula for this syrup were to be established for use in this country, to alter the strength so that each fluidrachm shall contain ¼ grain of codeine. In this case, it would require 16 grains of the alkaloid, instead of 18 grains, for each pint.

Formulæ asked for.

1. *Butt's Imperial Ointment.*
2. *B. S. Collins' Antidote for Morphine.* Our correspondent wants to know what it is composed of. "The maker charges from $7.50 to $20 per bottle."

CORRESPONDENCE

American Druggist.

GENTLEMEN:—In the June number Queries and Answers, No. 1,715, "Removing the Marks of Tattooing with India Ink (J. W. E.)," I showed an old man, whose arm was tattooed in several places, the question. This old man says: Take the milk from a woman's breast and use it the same as the India Ink is used in making the mark of tattoo. Use the same kind of needle used in tattooing, putting on and wiping off, and, by persevering, it will all be taken out.

You can send this to J. W. E., and, *if he so desires*, he can give it a trial. I think I would have to be in earnest before I would try his or what he has tried.

Respectfully,
N. G. DUNLAP.

ITEMS.

Pelletierine has been found by Dr. Galezowski, of Paris, to be a remedy for paralysis of branches of the third and sixth cranial nerves; improvement or cure having followed, in several instances, after three to six doses.

Urethan has been used by Dr. Abbot, of Boston, as a hypnotic in chorea with the most satisfactory results.

Populin—derived from the bark of the white Poplar—is said to relieve painful urination in doses of 2 to 4 grains.

Bismuth subnitrate, made into paste with water and applied to a swelled testicle, is said (*Med. and Surg. Rep.*) to remove pain at once, and the swelling presently.

Tobacco moistened with the juice of the water-cress, is said to prevent nicotine poisoning [?] without destroying the flavor of the smoke.

Sulphocyanide of Sodium has, according to Paschkis (*Schmidt's Jahrb.*), an action somewhat similar to strychnine, though less rapid.

Tincture of Opium of the British Pharmacopœia contains about 0.75% of morphine as compared with the same preparation after the U. S. P., which averages 1.4%.

Amyl Nitrite is recommended as the proper antidote for cocaine.

Linseed Oil as a Remedy for Itching.—A correspondent of the *Boston Medical and Surgical Journal* recommends the inunction of linseed oil as the best of all remedies for arresting the distressing itching of the anus with which so many persons are afflicted.

Subnitrate of Bismuth (according to *The Lancet*) has recently been given, with good effect, to cholera patients by a Spanish physician, in doses of 150 grains every half-hour.